THE ACCOUNTING REVIEW

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A FORUM ON THE FACTORS ASSOCIATED
WITH THE USE OF FINANCIAL STATEMENTS
BY SMALL AND NEW COMPANIES

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The Demand for Financial Statements in an Unregulated Environment: An Examination of the Production and Use of Financial Statements by Privately Held Small Businesses

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ABSTRACT: We examine the financial reporting practices of small privately held businesses that are not subject to SEC regulation. Specifically, we determine the factors associated with the production and use of financial statements for firms that have discretion in the preparation of financial statements and do not face the demands of public equity markets. In addition, for firms that prepare financial statements, we determine the factors associated with the sophistication of the financial statements in terms of whether the financials are compiled, reviewed, and/or audited by a professional accountant and whether the firm produces accrual-based financial statements. Finally, we examine the potential benefits afforded firms producing financial statements, having audited financial statements, and having accrual-based financial statements. We find that firms with audited financial statements benefit in the form of greater access to credit and that firms with accrual-based financial statements benefit in the form of a lower cost of credit.

Keywords: *financial reporting; small businesses; private companies; SEC regulation; accrual-based financial statements; cost of debt.*

Data Availability: *Data are available from sources identified in the paper.*

We thank Ken Cavalluzzo for his contributions and for motivating the Federal Reserve to collect the financial reporting information. We thank Christopher Ittner, Ivo Jansen, James MacDonald, Sundaresh Ramnath, John Wolken, and seminar participants at The George Washington University, University of Nebraska, Indiana University, Virginia Tech, and the 2008 Midwest Accounting Research Conference for their comments.

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I. INTRODUCTION

According to the United States Small Business Administration, small businesses represent 99 percent of all employer firms, employ over half of all private sector employees, represent 60 to 80 percent of job growth annually, and create more than half of the non-farm gross domestic product.[1] While small firms have a significant influence on the economy, little is known about their financial reporting practices and even less is known about the financial reporting practices of small *privately held* businesses because their financial reporting is not regulated by the Securities and Exchange Commission (SEC).

There is also little known about the factors associated with the production and use of financial statements by small businesses in the absence of regulation. The SEC requires public companies with greater than $10 million in assets and more than 500 owners to produce financial statements. However, there may be many forces besides firm size and the issuance of equity to outside shareholders that create a demand for financial statements. For example, managers' decision-making needs (Bushman and Smith 2001), owners' needs to mitigate agency problems (Watts 1977), and the needs of outside parties contracting with the firm (Watts 1977; Jensen and Meckling 1976) can create demands for financial statements. Therefore, we investigate the factors associated with the use of financial statements by small privately held firms that have discretion in the preparation of financial statements and do not face the demands of public equity markets. In addition, for firms that prepare financial statements, we determine the factors associated with the sophistication of the financial statements in terms of whether the financials are compiled, reviewed, and/or audited by a professional accountant and whether the firm produces accrual-based financial statements.

The demand for financial statements in an unregulated environment has received little attention in prior research primarily because data on privately owned firms have not been readily available. However, in 2003, the Federal Reserve Board conducted the National Survey of Small Business Finances (hereafter, NSSBF) thereby providing extensive data on privately held small firms, including information on their financial reporting practices.[2] These data allow us to examine factors influencing the demand for financial statements for firms that are not required to produce financial statements by law.

We perform an exploratory analysis of the factors associated with the production, use, and sophistication of financial statements by small privately held businesses. In performing the analysis, we use an inductive approach. Inductive research generally starts with observations and seeks to identify relations and patterns from which theories can be developed (Hyde 2000). Inductive research is, by definition, open-ended and exploratory. An alternative research method is to perform deductive research that seeks to use observations to test specific theories and hypotheses (Hyde 2000). For example, one could test whether the production and use of financial statements by small businesses is consistent with firm-value maximization theories, with principal-agent conflict theories, or with theories regarding how a firm's accounting practices evolve over time as the firm adapts to changes in its economic environment. Inductive research is part of a *theory development* process, while deductive research is part of a *theory testing* process, and research generally involves both research methods. Given that this is an initial investigation into the financial reporting practices of small privately held businesses and given that there are a number of theories that could be used to generate specific hypotheses (Petty 1991), we primarily rely on the inductive approach. Our objective in providing an exploratory analysis is to provide a foundation on which subsequent research and hypothesis development can be based (Tukey 1977; LeCornu et al. 1996). However, we recognize that not providing and testing specific hypotheses on the factors related to the production and use of financial statements by small privately held businesses may be viewed as a limitation of our approach.

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[1] http://www.sba.gov.

[2] The 2003 NSSBF survey, data, and technical codebook are available at: http://www.federalreserve.gov/pubs/oss/oss3/nssbftoc.htm.

We find evidence consistent with the demand for financial statements deriving from many sources. Consistent with the focus of the SEC, we find that firm size is related to the demand for financial statements. We find, however, that firm growth is also a driver of the production and use of financial statements. In addition, we find that firms with the limited liability organizational form and firms that rely more on trade credit are more likely to produce and use financial statements.

We also find that, for firms that prepare financial statements, the compilation, review, and/or audit of the financial statements by a professional accountant is related to the number of workers employed by the firm, the age of the firm, the number of business sites of the firm, and the average education of the owners of the firm. The use of accrual accounting is related to the age of the firm, the number of owners in the firm, the limited liability organizational form, and the use of trade credit. These results suggest that even in an unregulated environment with relatively little pressures from public equity markets, firms still have incentives to produce and use financial statements and that these incentives derive from a variety of sources.

We conclude the study with an analysis of potential benefits afforded firms producing financial statements, firms having audited financial statements, and firms producing accrual-based financial statements. We find that firms with audited financial statements are significantly more likely to be granted credit than those without audited financial statements. In addition, we find a negative association between interest rates and accrual-based financial statements. The rates for firms that issue accrual-based financial statements are almost 70 basis points lower than the rates for other firms. Thus, the production and sophistication of financial statements play a critical role in both access to credit and cost of capital among privately held small firms.

These results provide insight into the financial reporting practices of privately held small businesses, which we believe is important given the significance of these firms in the economy. The results may also be useful to standard-setters in assessing the impact of regulation on small businesses that are bound by SEC oversight. Concerns regarding the cost of regulation on small businesses have grown in recent years and are illustrated by the establishment of the Small Business Advisory Committee by the Financial Accounting Standards Board in 2004. Obtaining an understanding of the impact of regulation on small businesses begins with an understanding of the financial statements that would be produced by firms in the absence of regulation. In order to gain such an insight, Barton and Waymire (2004) examine the financial reporting practices of firms prior to the Securities Exchange Acts of 1933 and 1934. Accordingly, they examine firms' financial reporting decisions prior to regulation; however, they focus on one market force, the influence of public equity markets, on firm disclosure policy. The results of this study yield insights into the various internal and external market forces that influence the use and sophistication of financial statements in the absence of regulation.

The remainder of the paper is organized as follows. The next section develops the research questions related to the production and use of financial statements and the relation between financial statements and access to credit and the cost of credit. Section III describes the data and presents the descriptive statistics. The paper's results are presented in Sections IV and V. In section VI, we summarize the results and present our conclusions.

II. RESEARCH QUESTIONS

In the absence of regulatory requirements, it is likely that other forces create a demand for financial statements (Gjesdal 1981). While firms generally produce bank statements, tax forms, and other financial worksheets as part of normal business processing, these forms may not be useful for more complex decision making by managers or for efficient monitoring of the firm by outsiders. A fundamental role of accounting statements is to "provide decision makers with information useful in making economic decisions" (Meigs and Meigs 1993, 4) by improving the organization and consolidation of firm information. Therefore, financial statements may be more useful than tax forms, bank statements, and financial worksheets in many situations and contexts. For example, financial statements could be useful for management decision making (Bushman and Smith 2001), to mitigate agency conflicts between the managers and the owners of a firm (Smith 1776, 700; Berle and Means 1932; Jensen and Meckling 1976; Fama and Jensen 1983a; Fama and Jensen 1983b; Watts 1977; Gjesdal 1981), and to aid in the monitoring of contracting relationships between the firm and outside parties (Jensen and Meckling 1976). This suggests that various characteristics of the firm, such as its operating environment, its financial structure, and its relationships with outside parties, may affect the production of financial statements. This leads to our first research question:

> **Q1:** What are the factors associated with the production and use of financial statements by unregulated privately held small firms?

Once firms begin to produce financial statements, they can vary the relative sophistication of the statements to facilitate decision making and monitoring. We examine whether the sophistication of financial statements is systematically related to identifiable firm characteristics. The first dimension of financial statement sophistication that we examine is whether the financial statements are compiled, reviewed, and/or audited by a professional accountant. The proper application of accounting standards often requires a substantial amount of professional understanding and judgment. Whether small business owners have the necessary financial accounting knowledge or motivation is questionable. Therefore, financial statements that are compiled, reviewed, and/or audited by a professional accountant are likely to be more sophisticated than those that are not. The second dimension of financial statement sophistication that we examine is the use of accrual accounting. Cash-based accounting is simple and familiar to most people because of its similarity to "checkbook accounting" used in personal finances. However, accrual accounting, while being more complicated, reportedly provides a better measure of firm performance (Dechow 1994). Therefore, financial statements that are based on accrual accounting are likely to be more sophisticated than those based on cash accounting. We examine these two dimensions of financial statement sophistication to provide insight into our second research question:

> **Q2:** For those privately held small firms that have financial statements, what are the factors associated with the sophistication of the financial statements?

We also question whether firms with financial statements, firms with audited financial statements, and firms with accrual-based financial statements receive benefits in the form of a greater access to credit or a lower cost of credit. While creditors can require financial records in many forms, the provision of financial statements could yield benefits to the firm. By providing information on the financial activities of the firm in an organized and consolidated manner, financial statements may reduce information asymmetries associated with assessing firm risk (Bushman and Smith 2001). Financial statements may also provide a positive signal to potential creditors about the quality of firm management, and may therefore improve perceptions about the firm's creditworthiness. Finally, by including accounting numbers in debt covenants, the availability of accounting information presumably facilitates the ability of lenders to monitor firm behavior, potentially reducing the riskiness of extending the firm credit. To the extent firm risk is associated with credit availability and terms, firms with financial statements may have greater access to credit and/or a lower cost of credit than firms without financial statements.

Firms that choose to have their financial statements audited provide additional assurance to potential creditors about the risk of misstatements in their financial reports. If auditor assurance reduces lenders' monitoring costs (Watts and Zimmerman 1986), then lenders will be more likely to give loans and competition will force banks to pass along cost reductions to borrowers in the form of lower interest rates, *ceteris paribus* (Blackwell et al. 1998). Additionally, firms that produce accrual-based financial statements generally provide more relevant and useful financial information than do firms that produce cash-based financial statements. This will affect the ability of lenders to use accounting numbers in debt covenants to monitor firm behavior, leading to lower monitoring costs. This leads to our third research question:

> **Q3:** Is the production and sophistication of financial statements associated with a lower probability of loan denial and/or a lower cost of credit?

III. DATA AND DESCRIPTIVE STATISTICS

The Data

We use data from the 2003 NSSBF to examine the market forces associated with the use and sophistication of financial statements among privately held firms. The NSSBF data set is among the most extensive data sets available on small businesses.[3] The 4,240 firms in the sample represent 6.3 million for-profit, nonfinancial, non-farm, non-subsidiary small businesses in the United States with fewer than 500 employees. These data, collected via telephone interviews by the Federal Reserve and the Small Business Administration, are intended to provide national representation of small businesses in operation in the United States during 2003 and 2004. The usable sample consists of 4,004 small businesses.[4]

The data set provides information on firm financial characteristics, ownership and management characteristics, capital structure, relationships with suppliers, credit applications and denials, as well as the interest rate paid on the firm's most recent loan. Also contained in the data set is information on the written records used by the firm. Specifically, the survey asked the respondent "Do you have records available to help you answer questions about the firm's income, expenses, and balance sheet, such as tax records, statements, worksheets, or any other records?" This was followed by the question "What records are you using?" to which the respondent could answer financial statements, tax records, worksheets, or bank statements. NSSBF defines financial statements as an income statement and a balance sheet. If the firm used financial statements, then the survey also asked whether the firm's financial statements were compiled, reviewed, and/or audited by a professional accountant and whether the firm used accrual accounting in preparing the financial statements. Of the 4,004 firms, 790 (20 percent) responded as using financial statements.[5]

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[3] The survey used a two-stage data collection process. Firms were contacted in advance to verify addresses and identify a contact person. Firms were subsequently contacted to complete a screener questionnaire. Firms selected for participation in the main interview were sent an advanced worksheet listing the information that would be collected. Firms were then surveyed via a telephone interview.

[4] From an original sample of 4,240 firms, we drop 152 firms that reported being publicly traded and 84 firms with greater than 500 shareholders and $10 million in assets (i.e., firms meeting SEC guidelines potentially requiring the preparation of financial statements).

Methods and Variables

There are two important features of the NSSBF that influence the analyses of the data. First, the NSSBF did not use an equal-probability sample design. Instead, the design used was a stratified random sample with over-sampling based on employment size groups. The database contains sample weights and stratification variables to aid in estimating the population statistics by accounting for disproportionate sampling and nonresponse. These weights were used in the analysis to compute weighted statistics that account for the stratification. Second, as is customary in survey data, some of the missing variables were imputed. To obtain the imputed values, a model was developed to predict the missing values and a random term was added to the predicted value. The survey database provides five separate implicates that were used to derive the missing values. The descriptive statistics, correlations, and regression analyses were performed by using each of the multiple implicates, estimating the between-imputation variance of each parameter, and combining this variance with the sampling variance to obtain an overall variance (Rubin 1987; Little and Rubin 2002). Therefore, all the analyses presented account for the stratified sample design as well as the multiple imputations for missing values.[6]

To address the first research question, we conduct an exploratory analysis of the variables that relate to the firm's production and use of financial statements. We include the firm characteristics available in the data set that capture the forces faced by the firm that might create demands for financial statements. Specifically, we include the following firm characteristics in the analysis: the firm's age (*AGE*), an indicator variable to capture if the firm applied for a loan or a line of credit in the previous three years (*APPLY*), the firm's total assets (*ASSETS*), the firm's debt-to-asset ratio (*DEBTASSET*), the number of non-owner employees working for the firm (*EMPLOYEES*), an indicator variable to capture whether a firm is organized such that the owners have limited liability (*LIMITED*), an indicator variable to capture if the firm issued new equity in the last 12 months (*NEWEQUITY*), the number of owners in the firm (*NUMOWN*), an indicator variable to capture if the firm is managed by an owner (*OWNMANAGE*), the percentage of purchases that the firm makes using trade credit (*PERTRADE*), an indicator variable if the firm experienced sales growth for the year (*SGROWTH*), the number of business sites (*SITES*), and the average wages per employee (*WAGEMP*).

Descriptive Statistics

Table 1 provides descriptive statistics (means and standard errors) for the key variables in the study.[7] The first column reports summary statistics for the full sample of firms. These

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[5] In addition, 916 firms responded as having used tax statements, 295 firms as having used bank statements, 1,261 as having used the worksheet, 1,682 as having used memory, and 135 as having used some other source. We note that the respondents could choose more than one source when answering the survey question.

[6] We used *PROC SURVEYFREQ*, *PROC SURVEYMEANS*, *PROC SURVEYLOGISTIC*, and *PROC SURVEYREG* in SAS to adjust for the sampling stratification. We used *PROC MIANALYZE* in SAS to adjust for the use of multiple implicates in all of our analyses.

[7] Given the over-sampling of large firms and the use of five imputations for missing values, we use the *SURVEYMEANS* and *MIANALYZE* procedures in SAS to estimate the means and standard errors. These methods produce exact means and frequencies, but only a close approximation for medians. Therefore, we do not examine the medians in this analysis. See the 2003 SSBF Technical Codebook (2007) for information on the survey design, analysis procedures, and the limitations of using medians on data that is obtained through stratified random sampling and based on multiple implicates.

TABLE 1
Descriptive Statistics

	All Firms		**No Financial Statements**		**Financial Statements**		
n	**4,004**		**3,214**		**790**		
Parameter	**Estimate**	**Std. Error**	**Estimate**	**Std. Error**	**Estimate**	**Std. Error**	**t-test**[a]
AGE	14.2603	0.2210	14.2746	0.2444	14.1849	0.5061	−0.15
APPLY	0.3382	0.0096	0.3223	0.0104	0.4227	0.0240	3.82***
ASSETS	0.3536	0.0157	0.3054	0.0162	0.6089	0.0497	5.80***
DEBTASSET	0.2913	0.0075	0.2838	0.0082	0.3311	0.0187	2.31**
EMPLOYEES	7.8252	0.1534	7.0807	0.1597	11.7681	0.4550	9.71***
LIMITED	0.5170	0.0101	0.4882	0.0110	0.6694	0.0236	6.93***
NEWEQUITY	0.0539	0.0046	0.0532	0.0052	0.0575	0.0104	0.37
OWNMANAGE	77.3730	0.6281	78.4788	0.6795	71.5162	1.6315	−3.93***
OWNERS	1.8469	0.0604	1.7793	0.0647	2.2053	0.1657	2.39**
PERTRADE	38.3391	0.8341	36.8498	0.9004	46.2265	2.1643	3.99***
SGROWTH	0.4543	0.0102	0.4381	0.0112	0.5399	0.0252	3.68***
SITES	1.2793	0.0252	1.2526	0.0277	1.4210	0.0609	2.51**
WAGEMP	12471	414.21	11732	447.66	16396	1063.27	4.04***
DENIED	18.2389	1.244	18.7089	1.4347	16.1844	2.3105	0.93
RATE	6.5738	0.1327	6.5636	0.1445	6.6146	0.3203	0.14

***, **, * Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively.

Given the over-sampling of large firms and the use of five imputations for missing values, we use the *SURVEYMEANS* and *MIANALYZE* procedures in SAS to estimate the means and standard errors. See the 2003 SSBF Technical Codebook (2007) for information on the survey design and analysis procedures.

[a] t-statistic is from a test of the difference in means between firms that do and do not use financial statements.

Variable Definitions:
AGE = the number of years that the firm has been in business;
APPLY = 1 if the firm applied for a loan or a line of credit in the previous three years, 0 otherwise;
ASSETS = the firm's total assets (000,000);
DEBTASSET = the firm's debt-to-asset ratio;
DENIED = 1 if the firm was denied credit (loan or accounts payable) at least once in the last three years, 0 otherwise;
EMPLOYEES = the number of non-owner employees working for the firm;
LIMITED = 1 if the firm is organized with limited liability for the owners (corporation, S-corporation, limited liability company, or a limited liability partnership), 0 otherwise;
NEWEQUITY = 1 if the firm issued new equity during the year, 0 otherwise.
OWNMANAGE = 1 if the firm is managed by the owner, 0 otherwise;
OWNERS = the number of owners of the firm;
PERTRADE = the percentage of purchases for which the firm used trade credit;
RATE = the initial nominal interest rate paid on the firm's most recent loan;
SGROWTH = 1 if the firm experienced sales growth during the year, 0 otherwise;
SITES = the number of business sites that the firm operates; and
WAGEMP = the wage expense per employee.

businesses are small. The mean asset base is about $353,600. The firms also tend to be closely held. Seventy-seven percent of the firms are owner-managed and the mean number of owners is 1.85.

The table also provides separate descriptive statistics for the firms that do not produce and use financial statements and for those that do produce and use financial statements, respectively. The univariate differences of means uncover several important differences in firm characteristics between the two sets of firms. We find that firms using financial statements are 31 percent more likely to have applied for a loan or line of credit in the previous three years than firms not using financial statements. Firms using financial statements are twice as large, have a 17 percent higher debt to asset ratio, and have 66 percent more employees than firms not using financial statements. In addition, firms using financial statements are 37 percent more likely to be organized such that the owners have limited liability, are 9 percent less likely to be owner-managed, and have 23 percent more owners. Financial statement firms make 25 percent more purchases using trade credit, are 23 percent more likely to have experienced sales growth during the year, have 13 percent more business sites, and pay 40 percent more per employee. The firms that use and do not use financial statements do not appear to differ in age or in the likelihood of issuing new equity during the year. In addition, the summary statistics show no significant differences between firms that produce and use financial statements and those that do not in the access to credit or the cost of credit. Overall, these simple statistics suggest that there are important differences between the characteristics of firms that choose to produce and use financial statements and those that do not.

Table 2 reports descriptive statistics separately for the 790 firms that produce and use financial statements based on the sophistication of their financials. Of the 790 firms with financial statements, 496 (63 percent) have the financial statements compiled, reviewed, and/or audited by an accounting professional and 391 (49 percent) produce accrual-based financial statements.[8] The results uncover systematic differences between firms that use more and less sophisticated financial statements. Firms that have their financial statements compiled, reviewed, and/or audited by an accounting professional (use accrual accounting) are 2.7 times (3.5 times) the size of the firms that do not in terms of total assets. Firms that have their financial statements compiled, reviewed, and/or audited by a professional (use accrual accounting) also have twice as many employees (nearly three times as many employees), are 50 percent (85 percent) more likely to be organized such that the owners have limited liability, are 17 percent (27 percent) less likely to be managed by an owner, have 56 percent (87 percent) more owners, make 70 percent (117 percent) more purchases using trade credit, and have 13 percent (31 percent) more business sites than firms that do not use accrual-based financial statements or have their financial statements compiled, reviewed, and/or audited by a professional. Firms with accrual-based financial statements are also 28 percent more likely to have applied for a loan or line of credit in the previous three years, have a 34 percent higher debt-to-asset ratio, and pay their employees 61 percent more in wages than firms that do not use accrual-based financial statements or have their financial statements compiled, reviewed, and/or audited by a professional. On the other hand, there is no evidence of significant differences in firms that have their financial statements compiled, reviewed, and/or audited by a professional (use accrual accounting) in terms of age, the issuance of new equity during the year, or the likelihood that the firm experienced sales growth. The incidence of denial and the rate on loans do not differ significantly between firms that prepare more sophisticated financial statements and those that prepare less sophisticated financials.

Table 3 reports the correlation coefficients between the variables. The results suggest that the production and use and the sophistication of financial statements is positively

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[8] Within the 496 firms, 118 firms have their financials compiled, 163 have their financials reviewed, and 215 have their financials audited. In addition, 83 percent of the firms that have their financials compiled, reviewed, or audited also use accrual accounting.

TABLE 2
Descriptive Statistics

	Not Compiled, Reviewed, Audited, or Accrual		Compiled, Reviewed, and/or Audited			Accrual Accounting		
n	162		496			391		
Parameter	Estimate	Std. Error	Estimate	Std. Error	t-test[a]	Estimate	Std. Error	t-test[a]
ACCRUAL			0.3701	0.0341				
AGE	13.4816	0.8848	14.6228	0.7211	0.99	15.4809	0.8509	1.62
APPLY	0.3906	0.0462	0.4492	0.0330	1.03	0.4986	0.0392	1.78*
ASSETS	0.2105	0.0382	0.7922	0.0769	6.77***	0.9549	0.0867	7.85***
DEBTASSET	0.2878	0.0371	0.3373	0.0256	1.09	0.3860	0.0295	2.06**
EMPLOYEES	6.9671	0.7078	14.1549	0.6654	7.39***	17.5772	0.9053	9.23***
LIMITED	0.4677	0.0477	0.7289	0.0306	4.60***	0.8672	0.0278	7.22***
NEWEQUITY	0.0519	0.0223	0.0602	0.0141	0.31	0.0620	0.0155	0.37
OWNMANAGE	82.3495	2.2427	67.7819	2.3887	−4.44***	60.2138	2.8241	−6.13***
OWNERS	1.5817	0.1269	2.4724	0.2701	2.98***	2.9512	0.3567	3.61***
PERTRADE	29.4207	3.7747	50.2199	3.0151	4.30***	63.9832	3.1169	7.06***
SGROWTH	0.5545	0.0466	0.5391	0.0345	−0.44	0.5653	0.0434	0.17
SITES	1.2473	0.0669	1.4055	0.0631	1.71*	1.6333	0.1384	2.51**
WAGEMP	13056	2579.80	17462	1195.23	1.54	21019	1601.87	2.62***
DENIED	0.0922	0.0239	0.0832	0.0174	0.29	0.0938	0.0207	0.05
RATE	7.1741	0.9340	6.5669	0.3343	−0.20	5.7649	0.2586	−1.45

***, **, * Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively.

Given the over-sampling of large firms and the use of five imputations for missing values, we use the *SURVEYMEANS* and *MIANALYZE* procedures in SAS to estimate the means and standard errors. See the 2003 SSBF Technical Codebook (2007) for information on the survey design and analysis procedures.

[a] t-statistic is from a test of the difference in means between this set of firms and firms that do not have their financial statements compiled, reviewed, and/or audited by a professional and do not use accrual-based financial statements.

Please see Table 1 for variable definitions.

TABLE 3
Pearson Correlation Coefficients

	FINSTMT	***CRA***	***ACCRUAL***	***AGE***	***APPLY***	***ASSETS***	***DEBTASSET***	***EMPLOYEES***	***LIMITED***	***NEWEQUITY***	***OWNMANAGE***	***OWNERS***	***PERTRADE***	***SGROWTH***	***SITES***	***WAGEMP***	***DENIED***	***RATE***
FINSTMT	1.0	**0.99**	**0.14**	0.02	**0.11**	**0.17**	**0.05**	**0.15**	**0.16**	0.03	**−0.12**	**0.04**	**0.10**	**0.06**	0.02	**0.08**	0.01	−0.03
CRA		1.0	**0.13**	**0.04**	**0.12**	**0.21**	**0.05**	**0.18**	**0.15**	0.02	**−0.13**	**0.05**	**0.10**	**0.05**	0.01	**0.06**	−0.01	−0.04
ACCRUAL			1.0	**0.12**	**0.23**	**0.38**	**0.09**	**0.33**	**0.39**	**0.07**	**−0.27**	**0.10**	**0.37**	**0.05**	**0.06**	**0.13**	**0.05**	**−0.16**
AGE				1.0	**0.07**	**0.22**	**−0.09**	**0.17**	**0.04**	**−0.05**	**−0.12**	**0.12**	**0.16**	**−0.21**	0.00	**0.07**	**−0.06**	**−0.15**
APPLY					1.0	**0.32**	**0.26**	**0.29**	**0.29**	**0.05**	**−0.19**	**0.07**	**0.27**	**0.09**	**0.06**	**0.11**	**0.22**	0.00
ASSETS						1.0	**0.04**	**0.69**	**0.29**	**0.04**	**−0.35**	**0.23**	**0.31**	**0.04**	**0.08**	**0.17**	−0.00	**−0.22**
DEBTASSET							1.0	**0.08**	**0.20**	**0.07**	**−0.09**	**0.03**	**0.10**	**0.05**	**0.03**	**0.03**	**0.13**	**0.08**
EMPLOYEES								1.0	**0.29**	**0.05**	**−0.32**	**0.22**	**0.27**	**0.09**	**0.14**	**0.06**	0.01	**−0.18**
LIMITED									1.0	0.02	**−0.32**	**0.10**	**0.30**	**0.07**	**0.05**	**0.13**	**0.06**	**−0.14**
NEWEQUITY										1.0	**−0.04**	**0.07**	**0.03**	**0.05**	0.01	0.02	**0.08**	−0.00
OWNMANAGE											1.0	**−0.28**	**−0.23**	**−0.06**	**−0.05**	**−0.10**	−0.01	**0.09**
OWNERS												1.0	**0.07**	0.02	**0.03**	**0.05**	0.01	−0.04
PERTRADE													1.0	**0.04**	**0.04**	**0.10**	**0.04**	**−0.13**
SGROWTH														1.0	**0.04**	0.02	**0.04**	**0.14**
SITES															1.0	**0.07**	**0.05**	−0.01
WAGEMP																1.0	−0.01	**−0.07**
DENIED																	1.0	**0.07**
RATE																		1.0

Bold values reflect significant correlations at the 10 percent level (two-tailed).

Variable Definitions:

FINSTMT = 1 if the firm uses financial statements, 0 otherwise;
CRA = 1 if the firm had its financial statements compiled, reviewed, and/or audited by an accounting professional, 0 otherwise; and
ACCRUAL = 1 if the firm prepared accrual-based financial statements, 0 otherwise.

Please see Table 1 for additional variable definitions.

correlated with the application for loans, total assets, the debt-to-asset ratio, the number of employees, the use of the limited liability organizational form, the number of owners, the percentage of purchases made using trade credit, the experiencing of sales growth, and the wages per employee. The production and use and the sophistication of financial statements is negatively correlated with owner-management.

Table 4 reports the distribution of firms that produce and use financial statements and the distribution of firms with sophisticated financial statements by firm size deciles and by ownership structure, the dimensions considered by the SEC for the demand for financial statements. Panel A presents the percentage of firms using financial statements by asset deciles. The distribution indicates that the percentage of firms within each asset decile that produces and uses financial statements generally increases monotonically with firm size. Only 10 percent of the firms in the smallest asset decile produce and use financial statements, while approximately 31 percent of the firms in the largest decile produce and use financial statements. For firms that produce financial statements, there is also a general monotonic increase in the percentage of firms that have the financial statements reviewed, compiled, and/or audited and in the percentage of firms that prepare accrual-based financial statements. Over half of the firms in the largest size decile that have financial statements use accrual accounting and have the financial statements reviewed, compiled, and/or audited.

TABLE 4

Production and Use and the Sophistication of Financial Statements by Firm Size and Ownership Structure

Panel A: By Deciles Based on the Firm's Total Assets

Rank	*ASSETS*	*FINSTMT*	*CRA*	*ACCRUAL*
1	0.001878	9.99%	6.64%	8.12%
2	0.011622	11.46%	10.07%	9.93%
3	0.028588	11.13%	11.11%	16.23%
4	0.057766	12.94%	15.68%	19.68%
5	0.107331	16.58%	13.63%	26.99%
6	0.207423	14.18%	20.23%	30.76%
7	0.399523	22.85%	31.73%	40.70%
8	0.836507	28.94%	35.95%	45.96%
9	1.883691	27.30%	47.02%	57.48%
10	5.236398	30.89%	51.27%	55.49%

Panel B: By Ownership

Ownership	*ASSETS*	*FINSTMT*	*CRA*	*ACCRUAL*
Unlimited Liability	0.180971	10.87%	10.88%	11.27%
Limited Liability:				
1 owner	0.35087	19.10%	22.89%	31.46%
2 owners	0.44494	21.11%	25.22%	40.48%
3–5 owners	1.01185	22.83%	34.15%	45.18%
6–10 owners	1.26569	23.09%	35.25%	53.19%
>10 owners	1.46295	26.35%	45.40%	60.34%

Please see Tables 1 and 3 for variable definitions.

Panel B of Table 4 reports the percentage of firms that produce and use financial statements and the percentage of firms that have more sophisticated financial statements by ownership structure. The evidence indicates that the percentage of firms that produce and use financial statements is smallest for firms in which the owners have unlimited liability and is increasing in the number of owners for limited liability firms. Only 11 percent of firms organized as proprietorships or partnerships produce and use financial statements while 26 percent of firms with limited liability and greater than ten owners produce and use financial statements. We note, however, that while there is a monotonic increase in the percentage of firms using financial statements across the number of owners in limited liability firms, the increase does not appear to be pronounced, ranging from 19 percent for firms with one owner to 26 percent for firms with greater than ten owners. The general monotonic pattern is also observed for firms with financial statements that are compiled, reviewed, and/or audited and for firms using accrual accounting. Over 60 percent of limited liability firms with greater than ten owners use accrual accounting when they prepare financial statements and 45 percent of the firms have the financial statements compiled, reviewed, and/or audited. These descriptive statistics, along with those reported in Tables 1 through 3, suggest that the production and use and the sophistication of financial statements differ based on characteristics of the firms. In the next section, we use regression analysis to examine *ceteris paribus* differences in the characteristics of firms that use financial statements.

IV. THE RELATION BETWEEN THE PRODUCTION AND USE AND THE SOPHISTICATION OF FINANCIAL STATEMENTS AND FIRM CHARACTERISTICS

Results on the Production and Use of Financial Statements

We use logistic regression analysis to compare the characteristics of firms that choose to produce and use financial statements to those that do not.[9] The dependent variable, *FINSTMT*, is set to 1 if the firm produces and uses financial statements and 0 otherwise. We include *AGE*, *APPLY*, *ASSETS*, *DEBTASSET*, *EMPLOYEES*, *LIMITED*, *NEWEQUITY*, *ln(OM)*, *OWNERS*, *PERTRADE*, *SGROWTH*, *SITES*, and *WAGEMP* to capture characteristics of the firm.[10] The variables are as described previously; however, *ln(OM)* reflects the logarithm of the average percentage ownership of the top three owners who also manage the firm. The variable, therefore, captures not only owner-management, but also the extent of ownership by management.

We also include variables to capture the characteristics of the owners, the use of computers in the business, both for operations and for accounting, and the type of business. Specifically, we include *EXPERIENCE* and *EDUCATION* to capture the characteristics of the owners of the business that might influence the decision to prepare financial statements. *EXPERIENCE* and *EDUCATION* capture the weighted average business experience and education level, respectively, of the owners, where the weights are based on the percentage ownership. We also include *COMPUTER* (*COMPACC*) to capture whether the firm uses a computer for its business operations (accounting and bookkeeping functions). The use of a computer might reduce the relative cost of preparing financial statements and therefore be positively related to the production and use of financial statements. We include *MANUFACTURE, SERVICE,* and *REGULATED* to capture companies in manufacturing, service, and regulated industries, respectively. The excluded business type is the retail and wholesale trade industries. Barton and Waymire (2004) suggest that the information managers provide to regulatory agencies can act as a substitute for financial statements. This suggests that firms in regulated industries may be less likely to produce and use financial statements than other firms. Alternatively, the regulatory process might be facilitated by the preparation of financial statements and may increase the importance of high-quality financial information such as that provided by financial statements. Based on this prior work suggesting that there may be differences in financial reporting practices across business types, we include the business type variables in the regression.

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[9] Given the over-sampling of large firms and the use of five imputations for missing values, we use the *SURVEYLOGISTIC* and *MIANALYZE* procedures in SAS to estimate the parameters. See the 2003 SSBF Technical Codebook (2007) for information on the survey design and analysis procedures.

[10] We also ran a regression with *PPTAX* as an explanatory variable to capture firms that are treated as a proprietorship or partnership as opposed to a corporation for tax purposes, with *FAMILY* as an explanatory variable to capture firms that are over 50 percent owned by a single family, with *TYPE* to capture the type of loans outstanding (e.g., mortgage, line of credit, equipment loan), and with *OWNLOAN* to capture firms with loans to an owner and more than one owner. None of these variables is significant and their inclusion does not affect the inferences related to the other variables.

We also include several control variables that are not tabulated in the interest of brevity. Specifically, we include controls for the location of the business, the incentive the firm accepted for responding to the survey, and whether the firm filled out and returned the requested worksheet in advance of the interview as a control for the "buy-in" of the respondent to the seriousness and importance of the survey. The complete results are available from the authors.

The results of the logistic regression on the factors related to the production and use of financial statements by privately owned small firms are presented in Table 5. The model predicts 66.9 percent to 67.5 percent of the observations correctly across the five implicates and, as measured by the χ^2 statistics of between 133.8 and 135.3 across the implicates, the model is highly significant ($p < 0.001$).

The results in Table 5 suggest that several dimensions of the firm and its business environment are significantly related to the production and use of financial statements. Specifically, firms with more assets (*ASSETS*) are more likely to produce and use financial statements. This result is consistent with claims by Bushman and Smith (2001) that financial statements play a fundamental role in management decision making and become particularly important as the business environment of the firm becomes more complex. Firm size could also be significantly related to financial statement production because larger firms may be more likely to be planning to obtain external capital and/or more likely to have sufficient accounting skills and manpower to prepare financial statements. It is possible that larger firms are more likely to have financial statements because they are preparing themselves to become public and to meet the regulatory requirements of the SEC as they approach the $10 million dollar asset threshold.

In addition, firms organized such that the owners have limited liability (*LIMITED*) are significantly more likely to produce and use financial statements than other firms. This is consistent with a large body of research that suggests that management and ownership structure is related to firm agency problems (Smith 1776, 700; Berle and Means 1932; Jensen and Meckling 1976; Fama and Jensen 1983a; Fama and Jensen 1983b) and, by providing information on firm performance, that financial statements can play a critical role in mitigating agency problems (Watts 1977; Gjesdal 1981). Owners with limited liability are likely to have lower incentives to personally and continually monitor firm behavior than owners with unlimited liability because of the limit on the potential losses. Therefore, financial statements may provide a low-cost and efficient method of monitoring the firm. In addition, external creditors may be more likely to require financial statements to monitor activities (e.g., through the use of debt covenants based on accounting numbers) for firms

TABLE 5
Analysis of the Production and Use of Financial Statements

Parameter	Estimate	t-statistic	Pr > |t|
Intercept	−1.4101	−6.46	<.0001
AGE	−0.0033	−0.93	0.3524
APPLY	0.0739	1.05	0.2939
ASSETS	0.0646	2.06	0.0398
DEBTASSET	0.0085	0.10	0.9228
EMPLOYEES	0.0016	1.53	0.1252
LIMITED	0.2554	3.45	0.0006
NEWEQUITY	−0.0731	−0.56	0.5730
ln(OM)	−0.0148	−0.55	0.5790
OWNERS	−0.0007	−0.10	0.9191
PERTRADE	0.0016	1.90	0.0568
SGROWTH	0.1757	2.64	0.0083
SITES	−0.0012	−0.36	0.7205
WAGEMP	0.0000	0.88	0.3764
EXPERIENCE	0.0062	1.76	0.0787
EDUCATION	0.0305	1.66	0.0967
COMPUTER	−0.0781	−0.54	0.5891
COMPACC	0.2445	2.24	0.0250
MFG	−0.0622	−0.64	0.5243
SERVICES	0.0445	0.53	0.5986
REGULATED	0.0000	0.00	0.9997
# observations		4,004	
F-statistic		41.21	
(p-value)		(<0.0001)	

Given the over-sampling of large firms and the use of five imputations for missing values, we use the *SURVEYLOGISTIC* and *MIANALYZE* procedures in SAS to estimate the coefficients. See the 2003 SSBF Technical Codebook (2007) for information on the survey design and analysis procedures.

The dependent variable *FINSTMT* = 1 if the firm uses financial statements, 0 otherwise; *ln(OM)* = the natural log of the average ownership percentage of the top three owners of the firm that also manage the firm; *EDUCATION* = weighted average education level of the owners, weighted by ownership; *EXPERIENCE* = weighted average experience of the owners, weighted by ownership; and *MANUFACTURE, SERVICE, REGULATED* = 1 if the firm is in a manufacturing industry, service industry, or regulated industry, respectively, and 0 otherwise (the omitted business type is wholesale and retail trade).

We also included several control variables that are not tabulated. We included a control for *REGION* to capture the location of the business (East Coast, Central, or West Coast) with West Coast excluded; *INCENTIVE* to capture the incentive the firm accepted to respond the survey ($50 in cash or a package of reports for small businesses from Dun & Bradstreet, which retails for $199), and *BUYIN* to capture whether the firm filled out and returned in the requested worksheet in advance of the interview as a measure of the seriousness and importance that the firm placed on the data collection.
Please see Tables 1 and 3 for additional variable definitions.

in which their ability to pursue owner assets is limited. To mitigate agency problems associated with debt, Jensen and Meckling (1976) argue that creditors might demand monitoring and bonding contracts. These contracts are often based on accounting data (Smith and Warner 1979; Leftwich 1983); therefore, to the extent that maintaining financial statements facilitates the monitoring process, debt financing should create a demand for financial

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statements. In addition, Avery et al. (1998) find that the firm's financial position is relatively more important for limited liability firms than for unlimited liability firms since the personal assets of the owners are protected.

The results also suggest that firms that rely more on trade credit for purchases (*PERTRADE*) are significantly more likely to produce and use financial statements. Borrowing from suppliers represents a potentially important source of firm financing. In fact, Petersen and Rajan (1997, 661) note that trade credit, i.e., the borrowing from suppliers, is the single most important source of short-term external finance for firms in the United States. The positive relation between the use of trade credit and the production and use of financial statements is consistent with suppliers demanding financial statements to assess the firm's creditworthiness and to facilitate the monitoring of the firm (Smith and Warner 1979; Leftwich 1983). The positive relation between the use of trade credit and the production and use of financial statements is also consistent with financial statements providing useful consolidated information for managers when the firm has more complex financial relations with its suppliers.

The results also suggest that firms with sales growth (*SGROWTH*) are more likely to produce and use financial statements than firms with no sales growth. These results are consistent with Bushman and Smith's (2001) argument that a demand for financial statements derives from decision-making needs. The results suggest that as the firm becomes more complex through growth that the managers may produce financial statements to aid in decision making. Firms with high growth are also more likely to require access to external funds and to outside contracting. Therefore, growth could also capture the need for financial statements to increase the efficiency of contracting with entities external to the firm and allay fears related to agency conflicts.

We also find that firms with more experienced and educated owners and firms that use computers for accounting and bookkeeping within the firm are more likely to produce and use financial statements. However, we do not find that the type of business is related to the production and use of financial statements.

In summary, we find evidence that many forces create incentives for firms to produce and use financial statements. Larger firms, firms experiencing sales growth, firms in which the owners have limited liability, and firms that rely more on trade credit are more likely to produce and use financial statements.

Results on the Sophistication of Financial Statements

In Table 6, we report on the relation between the characteristics of the firm and the sophistication of financial statements for firms that produce financial statements. We include the same explanatory variables as in the analysis of the production and use of financial statements.[11] We use an ordered probit analysis to examine the first dependent variable (*MCRA*) that captures whether the financial statements of the firm are compiled, reviewed, and/or audited by an accounting professional. As Blackwell et al. (1998) state:

> Private firms choose one of four levels of auditor association. Audits, which provide reasonable assurance of a low risk of material misstatement, require a comprehensive evaluation of whether the financial statements are prepared according to generally accepted accounting principles (GAAP). Reviews are less comprehensive than audits and provide negative assurance, indicating a moderate risk of material misstatement. In a

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[11] We note that the decision to have financial statements audited might be a function of the cost of auditing services; however, we have no information on audit costs for the sample firms.

TABLE 6
Analysis of the Sophistication of Financial Statements

	Compiled, Reviewed, and/or Audited (*MCRA*)			Accrual Accounting (*ACCRUAL*)		
Parameter	**Estimate**	**t-stat**	**Pr > |t|**	**Estimate**	**t-stat**	**Pr > |t|**
Intercept_1	−0.2673	−0.70	0.4868	−1.7070	−3.35	0.0008
Intercept_2	−0.6813	−1.77	0.0775			
Intercept_3	−1.1592	−2.98	0.0031			
AGE	0.0174	2.26	0.0246	0.0175	2.01	0.0449
APPLY	−0.1265	−0.94	0.3468	−0.0825	−0.54	0.5922
ASSETS	0.0899	1.47	0.1429	0.0852	1.35	0.1758
DEBTASSET	−0.0828	−0.46	0.6441	0.2254	1.13	0.2566
EMPLOYEES	0.0038	1.79	0.0733	−0.0000	−0.01	0.9907
LIMITED	0.1509	0.97	0.3319	0.7263	3.66	0.0003
NEWEQUITY	0.2484	0.80	0.4244	0.1303	0.42	0.6710
ln(OM)	0.0214	0.42	0.6744	−0.0505	−0.90	0.3677
OWNERS	0.0111	0.90	0.3677	0.0762	3.00	0.0027
PERTRADE	−0.0008	−0.47	0.6418	0.0067	3.80	<.0001
SGROWTH	0.0151	0.12	0.9055	0.0403	0.27	0.7881
SITES	−0.0634	−1.78	0.0765	0.0858	1.26	0.2073
WAGEMP	−0.0000	−0.40	0.4163	0.0000	0.11	0.9135
EXPERIENCE	−0.0100	−1.25	0.2137	−0.0055	−0.62	0.5322
EDUCATION	−0.0997	−2.56	0.0117	0.0139	0.32	0.7504
COMPUTER	0.3332	1.01	0.3147	−0.4534	−1.18	0.2384
COMPACC	0.3548	1.48	0.1394	0.7383	2.46	0.0140
MFG	−0.2627	−1.63	0.1032	−0.1967	−1.00	0.3191
SERVICES	−0.2408	−1.53	0.1263	−0.3450	−1.85	0.0637
REGULATED	−0.1135	−0.46	0.6481	−0.4082	−1.61	0.1085
# observations		790			790	
F-statistic		67.68			109.22	
(p-value)		(<0.0001)			(<0.0001)	

Given the over-sampling of large firms and the use of five imputations for missing values, we use the *SURVEYLOGISTIC* and *MIANALYZE* procedures in SAS to estimate the coefficients. See the 2003 SSBF Technical Codebook (2007) for information on the survey design and analysis procedures.

The dependent variable *MCRA* = 0 if the firm has financial statements that are not compiled, reviewed, and/or audited by a professional, 1 if the firm has financial statements that are compiled by a professional, 2 if the firm has financial statements that are reviewed by a professional, and 3 if the firm has financial statements that are audited by a professional. The dependent variable *ACCRUAL* = 0 if the firm has financial statements that are not accrual-based, and 1 if the firm has financial statements that are accrual-based.

Please see Tables 1, 3, and 5 for additional variable definitions.

compilation, the accountant assembles the firm's financial information and puts it into a format consistent with GAAP but provides no assurance about the risk of material misstatement. Company-prepared statements have no association with an independent accountant.

We therefore capture the level of association with a professional accountant as a measure of financial statement sophistication. *MCRA* is set to 0 if the firm has financial statements that are not compiled, reviewed, and/or audited by a professional, 1 if the firm has financial statements that are compiled by a professional, 2 if the firm has financial statements that are reviewed by a professional, and 3 if the firm has financial statements that are audited by a professional. Note that *MCRA* is different from the *CRA* variable used in Tables 2 through 4. While *CRA* is a dichotomous variable that equals 1 if the firm's financial statements are compiled, reviewed, and/or audited by a professional, and 0 otherwise, *MCRA* is a multichotomous variable that captures the level of assurance.

The second dependent variable *(ACCRUAL)* captures the use of accrual-based financial statements. As with the variable used earlier, *ACCRUAL* is set to 0 if the firm has financial statements that are not accrual-based, and 1 if the firm has financial statements that are accrual-based. We use a standard probit analysis to examine the use of accrual-based financial statements.[12]

The first model (*MCRA*) predicts 62.7 to 63.2 percent of the observations correctly across the five implicates. In addition, the Wald χ^2 statistics of 56.6 to 68.8 across implicates suggest that the model is significant ($p < 0.0001$). The professional accountant's level of association with the financial statements is significantly positively related to the firm's age (*AGE*) and the number of employees in the firm (*EMPLOYEES*). The relation between the sophistication of financial statements and firm age and the number of employees is consistent with the claims by Bushman and Smith (2001) that more sophisticated financial statements may be demanded by management for decision making needs as the firm becomes more complex. It is also consistent with the notion that older firms are more likely to have the resources to hire professional accountants to compile, review, and audit the firm's financial statements. Additionally, the significance of the number of employees is consistent with contracting relationships creating incentives for firms to produce and use sophisticated financial statements. To the extent that employees use financial statements to evaluate the risk of contributing their human capital to the firm, firms with more employees may be more likely to prepare more sophisticated financial statements.

The compilation, review, and/or audit of financial statements is significantly negatively related to the number of business sites (*SITES*). The negative correlation with the number of business sites could be related to complexity in that businesses with few sites are not likely to have sophisticated financial reporting needs. The results also suggest that owners with high education levels are less likely to feel the need to hire professional accountants to compile, review, and audit the financial statements. No other variables are significantly related to the compilation, review, and/or audit of financial statements.

The second set of results uses *ACCRUAL* as the dependent variable. The model predicts 78.2 to 78.5 percent of the observations correctly across the five implicates and has Wald χ^2 statistics of 109.2 to 111.0 across the implicates, which are highly significant ($p < 0.0001$). Consistent with the results for the compilation, review, and audit of financial statements, the results suggest that the use of accrual accounting is significantly positively related to firm age (*AGE*). The use of accrual accounting is also significantly positively related to the limited liability organizational form (*LIMLIAB*). As discussed earlier, the significance of the *AGE* and *LIMLIAB* variables could be related to the complexity of the firm, its contracting relationships, and/or the firm's attempts to mitigate its agency costs.

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[12] Results are qualitatively similar if logit is used.

The variables *OWNERS* and *PERTRADE* are positively related to the use of accrual accounting. The positive relation between accrual accounting and the number of owners is consistent with Jensen and Meckling (1976) that financial statements mitigate agency problems. Owners face a free-rider problem in that no single owner desires to incur the costs of monitoring while receiving only a fraction of the benefits (Black 1992). Additional owners might also increase the likelihood of conflicts among the owners (Shleifer and Vishny 1997; Nagar et al. 2000). As these agency problems become more pronounced, owners might require more sophisticated financial statements for monitoring purposes. The significant positive relation between the use of accrual accounting and the use of trade credit is consistent with accrual-based financial statements aiding in the mitigation of agency problems related to financing. It is also consistent with accrual-based financial statements providing more relevant information for decision making.

We also find that firms that use computers for accounting and bookkeeping within the firm are more likely to produce and use accrual-based financial statements and that service firms are less likely than firms in the retail and wholesale trade industries to produce financial statements using accrual accounting. No other variables are significantly related to the use of accrual accounting.

Additional Analysis on the Progression in the Production and Use and the Sophistication of Financial Statements

To gain additional insight into the progression in the use and sophistication of financial statements, we examined two additional models using ordered probit analyses. We first examined a model with the dependent variable, *SOPH1*, which is set to 0 if the firm uses memory, 1 if the firm uses bank statements, 2 if the firm uses tax statements, and 3 if the firm uses financial statements. We find that *SOPH1* is significantly positively related to *SGROWTH*, *LIMITED*, and *EMPLOYEES*. We next ran an ordered probit analysis with the dependent variable, *SOPH2*, which is set to 0 if the firm uses memory, 1 if the firm uses bank statements, 2 if the firm uses tax statements, 3 if the firm uses financial statements, 4 if the firm has its financial statements compiled, reviewed, and/or audited, and 5 if the firm uses accrual accounting. We find that *SOPH2* is significantly positively related to *ASSETS*, *AGE*, *SGROWTH*, *LIMITED*, *OWNERS*, *PERTRADE*, *NEWEQUITY*, and *EMPLOYEES*. These results, while not reported in a table, are available from the authors. The results are consistent with the results above that various dimensions of firm complexity, decision-making needs, agency conflicts, and contracting relationships play important roles in the progression in the use and sophistication of financial statements.

V. THE ASSOCIATION BETWEEN THE PRODUCTION AND USE AND THE SOPHISTICATION OF FINANCIAL STATEMENTS AND THE FIRM'S ACCESS TO CREDIT AND COST OF CAPITAL

In this section, we investigate whether firms that produce financial statements and/or have more sophisticated financial statements derive benefits from those statements through greater access to credit and/or a lower cost of credit. Financial statements may result in lower denial rates and cost of credit for at least three reasons. First, they may mitigate asymmetric information problems by providing useful and reliable information to the lending agent for evaluating the underwriting decision. Likewise, financial statements may provide a positive signal about the quality of the firm and management and may therefore improve the lender's perception about the creditworthiness of the firm. Third, to the extent creditors can write contracts based on the information contained in the statements, they may help to mitigate moral hazard problems associated with extending firms credit. The sophistication of the financial statements may increase the transparency of the statements and increase lenders' assurance that the statements are reliable.

Access to Credit

To assess the relation between the access to credit and the financial statement variables, we use an ordered probit analysis. The dependent variable (*DENIAL*) takes the value of 0 if the firm was approved for the loan, 1 if the firm was denied an application for trade credit, 2 if the firm was denied an application for a loan, and 3 if the firm was denied both trade credit and a loan in the previous three years. We include firms that have applied for credit in the past three years (a restriction placed by the NSSBF survey) in this analysis. In addition, we include firms that chose not to apply for credit at any time in the past three years because they feared denial. In the interview, respondents were asked "During the last three years, were there times when [the firm] needed credit, but did not apply because it thought the application would be turned down?" If respondents answered yes to this question, then they were included in the analysis and the variable, *FEAR*, was set to 1. We include these firms in the analysis in an attempt to control for a potential sample selection bias of excluding firms that have not have applied for credit because they had a higher chance of denial. The final sample includes 2,033 firms.

The variables of interest are whether the firm has financial statements (*FINSTMT*), whether the firm's financial statements are audited (*AUDIT*), and whether the firm uses accrual accounting in preparing the financial statements (*ACCRUAL*). A negative coefficient on any of these variables is consistent with the use of financial statements, or the sophistication of their financial statements, being related to the access to credit.[13]

We control for variables that have been found in prior research to be related to loan denials among privately held small businesses (see Cavalluzzo et al. 2002). Specifically, we control for the firm's financial characteristics (total assets, return on assets, asset turnover, the existence of sales growth, and debt-to-asset ratio), credit history (personal or business bankruptcies, delinquencies or judgments, and how often the firm has been late in paying accounts payables), information on the firm's relationships with financial institutions and suppliers, the characteristics of the owners (race, gender, experience, education, and personal wealth), the firm characteristics (age, organizational form, region of operations, and family ownership), as well as other variables that were found to be significant in explaining the use and/or sophistication of financial statements.

The results of the analysis on firm denial rates are reported in Table 7. The first column presents the results for the full sample of firms. The model predicts 80.2 to 80.4 percent of the observations correctly across the five implicates, and the Wald χ^2 statistics of 256.0 to 262.6 across the implicates are significant ($p < 0.0001$). Some of the noteworthy results on the control variables include the finding that firms with higher asset turnover ratios (*R_ATO*), firms that are owned by women (*GENDER*), and family owned firms (*FAMILY*) are significantly less likely to be denied credit. Firms with higher paid employees (*WAGEMP*) are marginally (p-value = 0.0519) less likely to be denied credit. On the other hand, firms with a higher debt-to-asset ratio (*DEBTASSET*), firms with prior business credit problems (*BUSINESS*), firms that more often pay accounts payable late (*LATEAP*), firms with black owners (*RACE*), older firms (*AGE*), and limited liability firms (*LIMITED*) are significantly more likely to be denied credit.

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[13] We included only the audit variable in the analysis due to significant multicollinearity problems associated with the *CRA* variable and the *FINSTMT* variable (see Table 3). When either compiled or reviewed is included in Tables 7 and 8, neither variable is significant and the results for the other variables are qualitatively similar.

TABLE 7
Relation between the Production and Use and the Sophistication of Financial Statements and the Probability of Loan Denial

	All Firms			Limited Liability			Unlimited Liability		
Parameter	**Estimate**	**t-stat**	**Pr > |t|**	**Estimate**	**t-stat**	**Pr > |t|**	**Estimate**	**t-stat**	**Pr > |t|**
Intercept_1	−0.5570	−1.34	0.1815	−0.0005	−0.00	0.9991	0.2575	0.25	0.7990
Intercept_2	−0.9354	−2.20	0.0280	−0.4420	−0.88	0.3787	−0.0791	−0.08	0.9376
Intercept_3	−2.0926	−5.15	<.0001	−1.7378	−3.62	0.0003	−1.2025	−1.18	0.2385
FEAR	0.3646	1.95	0.0512	0.2188	1.08	0.2801	0.5628	1.31	0.1887
FINSTMT	−0.0512	−0.38	0.7069	−0.0290	−0.19	0.8505	−0.1623	−0.40	0.6883
AUDIT	−0.4481	−1.88	0.0600	−0.4843	−1.66	0.0983	−0.7627	−1.23	0.2191
ACCRUAL	−0.0287	−0.24	0.8101	0.0244	0.18	0.8562	−0.1597	−0.63	0.5297
ASSETS	−0.0152	−0.20	0.8389	−0.1419	−2.33	0.0196	0.3200	2.49	0.0127
ROA	0.1240	1.21	0.2279	−0.0521	−0.41	0.6798	0.4028	1.79	0.0742
R_ATO	−0.0469	−2.33	0.0200	−0.0453	−1.87	0.0617	−0.0914	−1.98	0.0472
DEBTASSET	0.3031	2.09	0.0367	0.0006	0.00	0.9971	0.6829	3.06	0.0022
SGROWTH	0.0821	0.81	0.4199	0.1213	0.93	0.3510	0.1639	0.90	0.3667
PERSONAL	−0.0076	−0.06	0.9513	0.1045	0.60	0.5479	0.0150	0.07	0.9415
BUSINESS	0.2748	2.35	0.0187	0.2392	1.54	0.1238	0.4067	2.23	0.0258
RELATION	−0.0010	−1.30	0.1951	−0.0014	−1.67	0.0941	−0.0002	−0.20	0.8452
LATEAP	0.0063	3.51	0.0004	0.0064	3.05	0.0023	0.0047	1.60	0.1097
RACE	0.0078	3.93	<.0001	0.0061	1.98	0.0483	0.0078	2.84	0.0045
GENDER	−0.0031	−2.31	0.0208	−0.0017	−1.02	0.3065	−0.0033	−1.48	0.1376
EXPERIENCE	−0.0040	−0.67	0.5024	0.0078	1.03	0.3027	−0.0281	−2.60	0.0097
EDUCATION	−0.0304	−1.11	0.2660	−0.0509	−1.48	0.1387	0.0018	0.04	0.9710
PWEALTH	0.0013	1.39	0.1659	0.0009	0.74	0.4606	−0.1836	−1.69	0.0907
AGE	0.0124	1.84	0.0654	0.0023	0.30	0.7679	0.0335	2.84	0.0050
LIMITED	0.3735	3.13	0.0017						
REGION	0.0209	0.13	0.8975	−0.3897	−2.05	0.0405	0.6553	2.24	0.0252
ln(OM)	0.0314	0.63	0.5296	0.0680	1.28	0.2022	−0.0555	−0.59	0.5557
FAMILY	−0.4269	−3.14	0.0017	−0.4238	−2.85	0.0044	−0.7821	−1.81	0.0710
PERTRADE	0.0000	0.04	0.9662	0.0001	0.07	0.9435	0.0008	0.29	0.7753
EMPLOYEES	0.0000	0.00	0.9967	0.0024	1.40	0.1607	0.0009	0.23	0.8207
OWNERS	0.0009	0.15	0.8830	0.0033	0.52	0.6061	−0.2718	−1.74	0.0816
WAGEMP	−0.0000	−1.94	0.0519	−0.0000	−1.17	0.2438	−0.0000	−1.69	0.0919
COMPACC	0.0724	0.49	0.6272	0.1240	0.51	0.6089	0.0895	0.47	0.6362
# obs		2,035			1,495			538	
F-stat		25.15			20.90			23.44	
(p-value)		(<0.0001)			(<0.0001)			(<0.0001)	

Given the over-sampling of large firms and the use of five imputations for missing values, we use the *SURVEYLOGISTIC* and *MIANALYZE* procedures in SAS to estimate the coefficients. See the 2003 SSBF Technical Codebook (2007) for information on the survey design and analysis procedures.

Controls for the year, type of loan (renewal, line of credit, motor vehicle, equipment, mortgage, lease, or capital lease), the type of company (manufacturing, services, regulated), and the region in which the firm is headquartered (Central, East Coast, West Coast) are also included in the regression. For brevity, these variables are not included in the table. The complete model results are available from the authors.

(*continued on next page*)

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TABLE 7 (continued)

The dependent variable *DENIAL* = 0 if the firm was approved for the loan, 1 if the firm was denied an application for accounts payable, 2 if the firm was denied an application for a loan, and 3 if the firm was denied both accounts payable and a loan in the previous three years.

Variable Definitions:

FEAR = 1 if the firm reported that it chose not to apply for a loan or line of credit in the previous three years because of fear of denial, 0 otherwise;
ROA = return on assets defined as net income divided by total assets;
R_ATO = the decile rank of the firm's asset turnover ratio;
PERSONAL = 1 if the owner declared bankruptcy in the past seven years, was delinquent on obligations one or more times in the past, or has any judgments against him, 0 otherwise;
BUSINESS = 1 if the business declared bankruptcy in the past seven years, was delinquent on obligations one or more times in the past, or has any judgments against it, 0 otherwise.
RELATION = the number of months the firm had conducted business with the bank with which it applied for credit;
LATEAP = percentage of the time that the firm pays its accounts payable late;
RACE = 1 if the weighted average ownership of the firm that is black is greater than 50 percent, 0 otherwise;
GENDER = 1 if the weighted average ownership of the firm that is female is greater than 50 percent, 0 otherwise;
PWEALTH = net worth of the principal owner of the firm;
REGION = 1 if the firm primarily operates the business within the same region as the headquarters, 0 otherwise; and
FAMILY = 1 if the majority of the firm's ownership is within a single family, 0 otherwise.

Please see Tables 1, 3, and 5 for additional variable definitions.

Most important to our study, we find evidence that firms that have audited financial statements (*AUDIT*) are marginally significantly less likely to be denied credit. While the mere existence of financial statements (*FINSTMT*) does not appear to affect a firm's access to credit, it appears that lenders are more willing to grant access to credit if an external, independent third party has audited the financial statements. This provides evidence that using financial statements, but only audited financial statements, benefits the firm through greater access to credit.[14]

The sample of firms that applied for credit at least once in the past three years includes firms with limited and unlimited liability. Avery et al. (1998) find differences in treatment by lenders for firms with different liability characteristics. In particular, for firms with unlimited liability (proprietorships and partnerships), lending institutions may focus on the financial position of the owner. In contrast, the financial position of the business may become relatively more important to the lender when the firm has limited liability and the personal assets of the owner are protected from creditors. If this is the case, then the financial statements of firms with limited liability should be more helpful to creditors in the underwriting decision than they would be for firms with unlimited liability. To investigate this possibility, we estimate the model separately for firms with limited and unlimited liability (Columns 2 and 3 in Table 7, respectively).

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[14] There are time period issues related to credit denial analysis that we have attempted to address. The NSSBF data used in the loan denial analysis is based on whether a firm applied for and was denied a loan in the past 3 years, while the data on financial statement usage is for the period of the survey (2003–2004). So the fact that a firm was using financial statements (or had them audited) in 2003–2004 does not necessarily imply it was doing so when it applied for credit. We control for this time period difference by including indicator variables for the year of the application (or fear of application) in the regression. We also controlled for this by only performing the analysis for firms in which the reporting year is equal to the year of the application. The results are qualitatively similar.

For firms with limited liability, we find that the use of audited financial statements is still marginally significantly negatively related to the probability of loan denial. Interestingly, and in contrast, for unlimited liability firms, we do not find evidence that the use of financial statements, audited or accrual-based, is associated with a lower probability of loan denial. However, in this case the personal wealth of the owner (*PWEALTH*) is marginally significantly negatively related to the probability of loan denial. It is not clear to us why older (*AGE*) and larger (*ASSETS*) unlimited liability firms are more likely to be denied credit. The prior literature suggests that firm age and size should be positively related to access to credit. Perhaps these firm characteristics are correlated with a variable we could not control for due to the data limitations of our survey, or perhaps older and larger unlimited liability firms are more likely to be denied because they are in industries that are obsolete. The results suggest that the use of audited financial statements reduces the firm's probability of being denied credit.

Cost of Credit

Cole et al. (1996) report that the majority of small business external financing is institutional (i.e., bank loans). We conclude the study with an investigation of whether firms that use financial statements are charged lower rates on institutional credit. Only those firms that received credit within the past three years of the survey date are included in the analysis, resulting in a sample size of 1,482 firms.[15] The dependent variable, *RATE*, is the interest rate charged on the firm's most recent loan. *FINSTMT*, *AUDIT*, and *ACCRUAL* are included to capture the use and sophistication of the financial statements and are the variables of interest. A negative coefficient on any of these variables is consistent with the use of financial statements being associated with a lower cost of credit.

We draw on prior literature to control for other factors found to determine interest rates on loans to privately held small businesses (see for example, Cavalluzzo et al. 2002). Key determinants of the firm's interest rate found in prior literature include the firm's debt-to-asset ratio, whether the rate is fixed or variable, whether the firm has a savings account, and the size of the loan. We also include the variables that were significantly associated with the production and use of financial statements to ensure that any relation to interest rates on loans is driven by the financial statement variables and not to the characteristics of the firms that produce and use financial statements. The complete set of controls is included in Table 8. Many of these factors are not included in the table for brevity; however, the results are available from the authors.

Table 8 presents coefficient estimates from the analysis of the interest rate charged firms for the full sample of firms and for subsamples for firms with limited and unlimited liability, respectively. Some of the noteworthy results for the control variables include the finding that larger firms (*ASSETS*) have lower rates, while firms with fixed rate loans (*FIXED*) and firms that are charged higher fees and points (FEES) have higher rates. The results also provide evidence that firms with accrual-based financial statements (*ACCRUAL*) pay significantly less for credit. When the sample is separated into limited and unlimited liability firms, we find that the negative relation between *ACCRUAL* and the interest rate holds only for limited liability firms.[16] Limited liability firms with accrual-based financial statements pay almost 80 basis points less for credit. In order to interpret the cost savings

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[15] NSSBF only provides rate information on loans obtained within three years of the interview date.

[16] We also examined the results separately based on the size of the loan. The results do not differ across loan size categories.

TABLE 8
Relation between the Production and Use and the Sophistication of Financial Statements and Firm's Interest Rate on its Most Recent Loan

	All Firms			Limited Liability			Unlimited Liability		
Parameter	**Estimate**	**t-stat**	**Pr > |t|**	**Estimate**	**t-stat**	**Pr > |t|**	**Estimate**	**t-stat**	**Pr > |t|**
Intercept	7.3869	6.60	<.0001	7.8656	9.10	<.0001	6.3763	3.03	0.0027
FINSTMT	0.1100	0.33	0.7417	−0.0301	−0.09	0.9260	0.7318	0.68	0.4935
AUDIT	−0.0606	−0.11	0.9137	0.3170	0.56	0.5728	−2.5140	−1.25	0.2116
ACCRUAL	−0.6752	−2.51	0.0121	−0.7950	−2.65	0.0081	−0.2120	−0.37	0.7149
ASSETS	−0.1932	−2.12	0.0356	−0.2046	−2.30	0.0216	−0.0416	−0.11	0.9111
ROA	0.0759	0.26	0.7941	0.2368	0.90	0.3695	−0.5736	−1.00	0.3165
R_ATO	−0.0372	−0.69	0.4907	−0.0231	−0.44	0.6596	0.0296	0.28	0.7776
DEBTASSET	0.2736	0.79	0.4303	−0.2208	−0.57	0.5659	1.0254	1.66	0.0979
SGROWTH	0.2478	1.04	0.2989	0.2979	1.12	0.2632	0.2612	0.56	0.5774
SAVINGS	−0.1079	−0.41	0.6800	−0.6115	−2.56	0.0106	0.9041	1.59	0.1128
DENIAL	0.4921	1.40	0.1602	0.2694	0.57	0.5660	0.8844	1.71	0.0876
RELATION	−0.0012	−1.40	0.1614	−0.0000	−0.03	0.9780	−0.0018	−1.04	0.2981
LIMITED	−0.4146	−1.38	0.1673						
REGION	0.1888	0.75	0.4508	0.3204	1.18	0.2363	0.0829	0.14	0.8914
AMOUNT	−0.0000	−1.39	0.1659	−0.0000	−0.89	0.3722	−0.0000	−0.73	0.4682
FIXED	1.2171	4.69	<.0001	0.8855	3.19	0.0014	1.9574	3.88	0.0001
GUARANTEE	−0.4258	−1.59	0.1123	−0.2869	−0.92	0.3607	−0.7249	−1.48	0.1412
MATURITY	−0.0027	−1.99	0.0467	−0.0026	−1.51	0.1313	−0.0045	−1.74	0.0822
FEES	0.0000	2.53	0.0115	0.0000	2.41	0.0162	0.0000	0.61	0.5415
EMPLOYEES	−0.0038	−1.45	0.1470	−0.0032	−1.16	0.2457	−0.0230	−2.22	0.0264
OWNERS	0.0187	1.58	0.1235	0.0226	1.64	0.1126	0.0889	1.10	0.2704
PERTRADE	0.0020	0.59	0.5542	0.0030	0.76	0.4460	0.0044	0.74	0.4581
WAGEMP	−0.0000	−2.02	0.0440	−0.0000	−2.09	0.0363	−0.0000	−1.69	0.0945
ln(OM)	−0.0034	−0.04	0.9680	0.0432	0.52	0.6047	−0.2268	−0.84	0.4041
#obs		1,481			1,183			298	
F-stat		160.99			140.07			59.27	
(p-value)		(<0.0001)			(<0.0001)			(<0.0001)	

Given the over-sampling of large firms and the use of five imputations for missing values, we use the *SURVEYLOGISTIC* and *MIANALYZE* procedures in SAS to estimate the coefficients. See the 2003 SSBF Technical Codebook (2007) for information on the survey design and analysis procedures.

Controls for the year, *BUYIN*, *INCENTIVE*, type of loan (renewal, line of credit, motor vehicle, equipment, mortgage, lease, or capital lease), the type of company (manufacturing, services, regulated), and the region in which the firm is headquartered (Central, East Coast, West Coast) are also included in the regression. For brevity, these variables are not included in the table. The complete model results are available from the authors.

The dependent variable *RATE* = the initial nominal interest rate paid on the firm's most recent loan.

Variable Definitions:
SAVINGS = 1 if the firm has a savings account, 0 otherwise;
FIXED = 1 if the loan was with a fixed rate, 0 otherwise;
GUARANTEE = 1 if the loan was guaranteed, 0 otherwise;
MATURITY = months of the maturity of the loan; and
FEES = the fees and points paid for the loan.

Please see Tables 1, 3, 5, and 7 for additional variable definitions.

resulting from an 80 basis point reduction in interest rates, consider that a $100,000 loan (the median size loan in the sample) at 9.2 percent versus 10 percent would save about $800 a year in interest expense for the life of the loan. Thus, the results suggest that firms using accrual-based financial statements pay significantly less for credit than those firms without accrual-based financials.

VI. CONCLUSIONS

This study provides some of the first empirical evidence on the factors associated with the production and use of financial statements among small privately held firms. Like Barton and Waymire (2004) and others who have examined the reporting practices of large, publicly traded companies prior to the Securities Acts of 1933 and 1934, we find that firms have incentives to produce financial statements even in the absence of regulatory requirements to do so. But much of the prior literature assumes and the regulators appear to assume that the incentives to produce financial statements derive primarily from pressures from public equity markets. The results of this study show that even in environments with relatively little pressure from public equity markets, firms still have incentives to produce and use financial statements. We also find that firms with audited financial statements benefit in the form of greater access to credit and firms with accrual-based financial statements benefit in the form of a lower cost of capital.

This study focuses on the accounting practices of privately held small businesses. This approach has both strengths and weaknesses. In addition to the rich amount of newly available data on privately held firms, examining smaller firms allows for insights into some of the key motivating factors for financial statements that may not be possible from an examination of larger firms. We also note, however, that this study is not without limitations. In particular, we assume that firms that replied that they use financial statements and are using them to respond to the NSSBF have developed the records and use them for other activities as well. To the extent this assumption does not hold, it should weaken the power of the empirical tests. Likewise, the NSSBF only provides data for a single year, precluding us from examining factors motivating firms to start or discontinue compiling financial statements. In spite of these caveats, this paper provides some of the first empirical evidence of which we are aware on the demands for financial statements and the financial reporting practices of small privately held businesses.

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Financial Statement and Projection Preparation in Start-Up Ventures

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ABSTRACT: Using a representative sample of entrepreneurs who are in the process of starting a business, this study investigates the determinants of the preparation of financial statements and projections in start-up ventures. Consistent with predictions from information economics and contracting, I find that the use of outside funding, level of competition, and venture scale are positively associated with the intended frequency of financial statement preparation. However, comparing the economic significance of alternative influences suggests that the benefit of reducing competitive and fundamental uncertainty is more influential in explaining variations in intentions to prepare financial statements. Further, I find the determinants of preparation frequency vary among different financial statements; for instance, cash statements are more important for start-ups with products in earlier stages of development and with greater competition. In contrast to financial statements, the preparation of projections such as formal financial projections and regular sales forecasts by start-ups is positively associated with the importance of intangible investments such as patents, research and development, and with start-ups in high-tech industries.

Keywords: *accounting information; agency costs; decision-making; financial projections; financial statements; start-ups.*

Data Availability: *The PSED is publicly available at http://www.psed.isr.umich.edu.*

I. INTRODUCTION

This study investigates the determinants of financial statement and projection preparation by new ventures. Approximately 500,000 new ventures with employees are started each year in the U.S. alone, each with the choice of accounting system configuration and preparation frequency (Armington and Acs 2002). While there is substantial activity surrounding accounting system creation, there is very little empirical evidence on the forces that influence its creation and configuration (Davila and Foster 2005; Granlund and Taipaleenmaki 2005). In the absence of reporting requirements imposed on start-up ventures, voluntary preparation of financial statements reflects the economic incentives to prepare them less the cost of preparation. I examine entrepreneurs at the point of

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venture creation to understand this initial choice of financial statement and projection frequency, and consequently, the decision making and control roles of feed-back and feed-forward accounting information.

How frequently a firm prepares financial statements determines the minimum interval for which the firm can internally evaluate or voluntarily furnish the operating performance and financial position of the firm to owners or creditors. I offer competing explanations for the demands for interim reports of financial position and operational performance based on the contracting and monitoring needs arising from agency costs, and the decision-making role of accounting information. Further, I contrast the demand for financial statements, which are historic in nature, with the demand for financial projections.

The Panel Study of Entrepreneurial Dynamics (PSED) provides the opportunity to test the determinants of accounting information preparation at the point of firm creation. The unique feature of this data set is its sampling of entrepreneurs who are in the process of starting a venture. By identifying and surveying entrepreneurs in the process of starting ventures, this study overcomes potential confounding effects from survivorship, previous unobserved organizational events, or recall biases that arise when respondents are surveyed long after the activities of interest have occurred. Generally, researchers study the accounting systems of established firms, or, when examining adoption decisions of new firms, undertake investigation many years after the adoption event. For example, the firms surveyed by Sandino (2007) and Davila and Foster (2005) about their first adoption of management accounting systems (MAS) were, on average, 13.3 and 5.5 years old at the time of survey, respectively. Reducing the temporal period between when the accounting choices were made and the survey response lowers the potential for these biases to affect study inferences.

My results suggest that how frequently start-up ventures intend to prepare financial statements is positively related to outside financing, greater perceived competition, larger intended scale, and earlier stage product development. These findings are consistent with both contracting and decision-making needs increasing the demands for more frequent financial statement preparation. However, when I compare the economic significance of alternative influences, I find that non-stewardship factors, namely, decision-making benefits that reduce competitive and fundamental uncertainty, are more influential in explaining variations in intended frequency of financial statement preparation. Distinguishing between different financial statements, I find that competition is positively associated with intentions to more frequently prepare income and cash flow statements, and that low-price importance is positively related to the intended frequency of income statement preparation. While I observe the above effects for the flow statements, I find no support for informational or contracting explanations influencing intended frequency of balance sheet preparation. One explanation for the contrasting results between the statements investigated is that the limited assets of most start-ups, or the use of non-venture assets such as personal wealth, collateral, or guarantees, may reduce the role of the balance sheet in satisfying decision-making and contracting needs.

Comparing the determinants of financial statement preparation with those of financial projections reveals some important differences. In particular, the preparation of forecasts and projections is more frequent in start-ups that have intangible investments, such as patents and research and development, and those in high-tech industries. Competition is also found to be positively associated with intended sales forecast preparation. These findings are consistent with start-ups that have greater uncertainty of their future performance having greater demand for projections that can be used to plan and evaluate future performance. The above results are robust to alternative empirical specifications and alternative sample weighting.

By investigating what determines the frequency of financial statement preparation in new ventures, this study contributes by providing evidence that accounting information production choices at the firm's inception appear to be more closely associated with understanding uncertainty and securing competitive advantage to enable firm survival rather than stewardship and valuation demands. This primary finding is in contrast with evidence from the disclosure choice or voluntary reporting of financial statements made by large, listed firms based on capital market motives (Barton and Waymire 2004; Bradbury 1992; Butler et al. 2007; Leftwich et al. 1981; Sivakumar and Waymire 1994; Sivakumar and Waymire 2003). However, by considering financial statement choice to be a voluntary disclosure choice rather than a preparation choice, this large-firm literature implicitly ignores the informational needs of firm insiders. The relative importance of non-stewardship influences on new ventures' accounting information preparation is present both in *ex post* financial information production, such as income statements, and *ex ante* financial information, such as future predictions of sales. Overall, this evidence broadens our limited understanding of the adoption of accounting systems and creation of financial information by new firms, choices that underlie future financial accounting preparation and reporting as the firm grows and matures (Moores and Yuen 2001).

While this study's research design addresses several common method bias concerns, the inferences from survey-based research are only as reliable as the accuracy of respondents' answers. One concern is that entrepreneurs may overstate their intention to produce accounting information to present themselves in a favorable light to interviewers (Mick 1996), which may bias the variables of interest and result in greater noise in the estimation of coefficients. While comparing responses across subjects for each start-up may verify the accuracy of the responses, there is very limited ability to triangulate data for this sample, as 48.1 percent of the sample start-ups consist only of one team member. Further, unlike publicly listed firms and firms that have obtained financing from venture capitalists, there is no data from public sources. It should be noted that, while verification of realized accounting information was not available, Cassar (2007) documents a highly significant correspondence between the respondents' other expectations and actual outcomes recorded in the PSED follow-up interviews. Regardless, the limitations of using survey data should be considered in conjunction with the benefits from investigating accounting choices of a representative sample of ventures at the time of their creation.

The rest of the study is organized as follows. Section II provides the institutional setting and the potential demand for the preparation of financial statements and financial projections in start-up businesses. Section III describes the sample and discusses summary statistics on venture characteristics, and Section IV presents the empirical analyses and findings. Section V concludes.

II. BACKGROUND AND HYPOTHESES DEVELOPMENT

Start-Up Setting

During the nascent stage of a venture, activities are undertaken to establish the organizational structure and processes of the firm (Carter et al. 1996; Gatewood et al. 1995). These activities include: the selection and acquisition of physical, financial, and human resources; the establishment of operating procedures; compliance with regulatory requirements; and product development and promotion. During firm creation, the entrepreneur has substantial flexibility in formulating strategic and operating activities, from the amount of capital to invest, operating location and hours, choice of stakeholders, and target customers. Among the choices for the entrepreneur are how much to invest in the accounting function, what data will be collected and processed, and what information or outputs will be provided by the accounting function.

Firm creation is characterized by high uncertainty. The entrepreneur has uncertainty in regard to the markets to be served, the ability to serve these markets, the costs and profitability of the goods and services rendered by the firm, and the overall likelihood of achieving a successful operating business that is commensurate to the entrepreneur's investment and opportunity costs (Gimeno et al. 1997). Information about the environment, market, and operations can be collected to reduce uncertainty. However, given the many general and contextual factors that affect firm success and failure, and the large set of potential actions and states of nature, even after extensive information collection, substantial uncertainty can remain. For example, even established franchisers, with expert knowledge of the industry, suppliers, customers, and environment, and that screen for acceptable franchisees, still have franchises that close operations due to poor performance (Lafontaine and Shaw 1998).

Firm creation is also characterized by high information asymmetries between those operating the venture and those outside the firm. Information asymmetries are heightened in new firms for several reasons. First, much of the knowledge of a new firm is specific to the context of the venture and its environment. Therefore, it is more difficult for outsiders to assess its current and future viability and performance or the performance of its managers than for more established firms. Second, there are fewer alternative sources of information available to potential stakeholders in new and small ventures. Potential stakeholders cannot substitute firm information with information from intermediaries, such as financial analysts and press media, as intermediaries have little incentive to follow these firms (Barth et al. 2001). Therefore, stakeholders must rely more heavily on information created by new firms to lower information asymmetries than for larger and listed firms.

The accounting regulatory requirements are substantially lower for small or new ventures than for listed or large firms. Small firms are not required to provide quarterly or annual financial statements (Butler et al. 2007). Further, small firms are not required to have their financial statements or accounting systems audited or certified. Therefore, the regulatory environment of start-up ventures provides the opportunity to examine the factors that influence the preparation frequency choices of financial statements and projections, absent of regulatory requirements.

Explanations for Financial Statement Preparation

Interim preparation of financial statements involves significant costs. The choice of preparation frequency significantly affects the outlays invested in the accounting system and function. Costs should vary according to preparation frequency, due to the commitment of resources to undertake such preparation. For example, annual preparation may be required for tax purposes and can be undertaken after the completion of the financial year. This would require the collection, aggregation, and reviewing of accounting information at only one point in time per year. However, monthly preparation is a commitment to an accounting reporting cycle, whereby these tasks are undertaken regularly. This, consequently, would lead to the use of greater accounting resources, whether resourced internally, through the creation of an accounting function within the firm, or externally through the use of bookkeepers and chartered accountants (FASB 1986). The outlays associated with accounting system set-up and function are particularly important given the limited resources that start-up ventures generally have available. Thus, the decision of start-up ventures to prepare interim financial reports must entail an expectation of significant benefits.

Beyond enabling compliance with regulatory requirements, accounting systems and their outputs, such as financial statements, reduce information asymmetries and agency costs and provide decision-making benefits to the firm (Holthausen and Watts 2001; Zimmerman 2001). Substantial literature has examined how accounting information can be created and reported to reduce information asymmetries. Start-ups are susceptible to adverse selection, whereby those seeking capital from potential financiers have greater knowledge of venture quality, such as the venture's cash-generating potential and ability to meet future financial obligations, than the financiers. The greater the adverse selection from information asymmetries, the greater the likelihood that financiers will not invest in the start-up or will charge a higher cost of capital. Outsiders can use accounting information to evaluate the venture's current and future performance.

Accounting information can be used by firms and financiers as a cost-effective method of reducing agency costs, as it enables monitoring of the activities of those who operate the venture. Monitoring and contractually restricting the actions of those managing the venture should lower the costs from moral hazard, which results when firm managers act in self-interest rather than in the interests of the financiers. Incentives to evaluate and monitor the firm should be increasing in the venture's susceptibility to agency costs. Agency costs between the firm and financiers should lead firms to seek greater credibility and improved organizational control, with accounting system quality, such as regular financial statement preparation, being one mechanism to increase credibility and control (Ettredge et al. 1994). Thus, greater contracting and monitoring needs should increase the demand for accounting information, such as interim financial statements. Empirical evidence from publicly traded firms shows that firms' voluntary financial reporting frequency is a response to outsiders' demand for accounting information, which is an increasing function in uncertainty and agency costs (Butler et al. 2007; Chow and Wong-Boren 1987; Leftwich et al. 1981).

The use of outside funds and presence of multiple owners should also be related to accounting information production. Given the high uncertainty and information asymmetries of start-ups, the ability of a venture to attract funds for investment rests critically on the provision of information by the firm to potential financiers. Further, financiers need to continually assess the performance of the start-up and monitor those who manage it. Financial statements provide information for outside constituents to ensure that the entrepreneurs do not behave opportunistically (Gorman and Sahlman 1989). Therefore, under the supposition that interim reports reduce information asymmetry and agency costs, I conjecture that start-up ventures seeking outside financing sources are likely to prepare financial statements more frequently. Further, demand for accounting information production may vary by type of outside financer. Venture capitalists generally invest in firms where information asymmetries are high, suggesting that venture capital financing may be associated with an even greater demand for monitoring and accounting information (Davila 2005; Gompers 1995). The presence of more than one owner also creates demand for accounting information, as this assists in valuing the residual claims of the firm. The extent to which other owners are not involved in the direct management of the venture further increases the demand for monitoring. Thus, I expect that the frequency of financial statement preparation is increasing in the number of outside owners.

The organizational form of the venture should affect agency costs. If the owners are protected by limited liability, then there will be conflicts between firm equity holders and debt holders with regard to the risk of venture operations. In particular, after the firm obtains debt financing, equity holders have incentives for the firm to undertake more risky operations, as their equity stake benefits from the increased risk, but their downside is capped at their equity investment. Firm creditors also have the same downside loss, their debt investment, but they do not gain from increased risk bearing. In this setting, firm creditors would demand or contractually enforce timely information from the firm, such as regular financial statements, to monitor the risk of the firm. If the venture's equity holders have unlimited liability, then their downside loss is their entire net wealth. Therefore, equity holders' incentives for firm risk are reduced, resulting in more aligned incentives between equity and debt holders. Thus, I conjecture that limited liability will be positively related to the frequency of financial statement preparation.

Accounting information also plays an important role in decision making and performance evaluation. Information, such as the amount of sales and the account balances of customers with trade credit, is fundamental for a firm to operate. More processed information, such as aggregating all sales with expenses or all cash receipts with expenditures, provides a summary of financial performance that can be used to compare against established benchmarks or expectations, or guide in the setting of future benchmarks, evaluating the strategic and operational approaches of the firm, and, more fundamentally, assessing the choice of remaining operational or closing the venture. Indeed, accountants have long argued that the choice of when and what to produce is made by learning from successful and unsuccessful attempts at supplying a service, which can be achieved through comparison of expectations and current conditions partially expressed through the income statement (Littleton 1937, 19). Consistent with this notion, Chandler (1977, 109–110) documented that Pennsylvania Railroads as early as the 1850s compiled, collated, and synthesized financial transactions into tabulated monthly accounts in order to evaluate their performance and improve operating efficiency. Through the feedback provided by aggregated accounting information, insiders can update their priors for the future outcomes of the firm.

The benefits from feedback in updating priors increase with uncertainty. Little uncertainty means there is limited decision-making benefit from accounting system feedback. As uncertainty increases, the potential for, and magnitude of, prior revision increases. Further, the more timely the information, the more quickly the firm can respond to events and correct actions (Chenhall and Morris 1986). Evidence from MAS suggests that the perceived importance of information is positively associated with perceived environmental uncertainty (Gordon and Narayanan 1984). Even beyond MAS, evidence from public firms shows that greater uncertainty of financial performance increases demand for publicly disclosed interim reports (Bradbury 1992; Chen et al. 2002). Firms with investments in intangible assets, such as research and development and patents, and firms in high-tech industries generally have greater uncertainty of future outcomes. Therefore, financiers of firms that operate in more uncertain environments will demand that more timely accounting information be provided through financial statements. The stage of product development should also affect the demand for accounting information. The less developed the product, the greater the uncertainty of its costs and profitability, resulting in a greater need for accounting information (Davila 2000). Collation of all costs, through financial statements, can determine total costs associated with product development and improve understanding of the overall performance of the firm.

The demand for information for decision making and performance evaluation should be positively associated with the extent of competition. Information about the firm's current comparative standing should assist the entrepreneur in strategic and tactical planning in order to compete in the chosen industry. Entrepreneurial activity in a competitive setting has been described as a procedure of discovering facts, whereby firms apply information that is discovered for competitive advantage to increase profits and likelihood of survival (Hayek 2002, 13; Kirzner 1997). Further, heightened competition provides even greater incentive for further discovery of facts, such as profitability, to achieve better means of exploiting opportunities (Hayek 2002, 9–10). More competitive environments should be associated with more dynamism in the operations of the venture and its competitors to create and sell goods and services, placing greater importance upon monitoring its financial performance. Accordingly, survey evidence from management accounting suggests that the perceived usefulness of accounting information is greater for firms operating in more competitive environments (Chenhall and Morris 1986). Khandwalla (1972) finds that competitive forces affect the use of sophisticated management controls, although he finds no association between competition and the timeliness of accounting information. Therefore, I conjecture that frequency of financial statement preparation should be increasing in competition.

Ventures that place high importance on low prices in order to be competitive should be more likely to prepare financial statements. Indeed, economists have argued that the most obvious cost borne by firms in a market setting is determining what the relevant prices are (Coase 1937, 390). For example, firm's that charge prices that are too low will have worsening financial performance even given greater revenues as these inflows will not cover all the product and period costs from producing goods and services and operating the business. While charging higher prices reduces this risk, it increases the likelihood that customers will not purchase the firm's goods and services, which again may lead to worsening financial performance. The greater the importance of low prices to survival and venture success, the greater the emphasis on monitoring the costs and revenues, resulting in more demand for timely financial information (Chenhall and Langfield-Smith 1998). Therefore, as the importance of lower prices increases, I expect that start-up ventures will prepare their financial statements more frequently to assess their overall performance.

The costs and benefits of accounting information production rest critically on venture size. The marginal per-unit information-processing costs are decreasing in the volume of homogeneous transactions. Similarly, if marginal preparation costs are a decreasing function of scale, then larger ventures should be more likely to adopt more regular preparation of financial statements and projections. At the same time, the benefits from financial statement preparation from both a decision-making and an agency perspective are most likely an increasing function of scale. Agency costs are greater in larger firms since the total potential wealth transfers between the insiders of the firms and the owners and creditors are greater for larger firms (Ettredge et al. 1994). Accordingly, the greater the financial assets at stake for the entrepreneur, the more likely the demand for information to monitor those assets. Therefore, I expect that the greater the assets at stake for both insiders and outsiders, the more frequently start-up ventures will prepare interim reports.

The entrepreneur's knowledge of and experience with accounting and financial control are likely to be associated with financial statement and projection preparation for two reasons. First, knowledge of how to formulate financial projections and create financial statements reduces the costs associated with preparation. Second, those with accounting experience and education are more likely to recognize the benefits of such accounting activities (Davila and Foster 2005). Thus, I conjecture that accounting experience is related to more frequent preparation of financial statements and projections.

III. METHOD

Sample

The data for this study were obtained through the Panel Study of Entrepreneurial Dynamics (PSED). The PSED was an initiative of the Entrepreneurship Research Consortium (ERC), a collective of over 30 universities and institutions. The objective of the PSED was to provide a greater understanding of the venture start-up process, which was achieved through a longitudinal survey comprised of several phone interviews and mail questionnaires.

The PSED screening process involved 64,622 individuals, aged 18 or older, who were selected using stratified random-digit-dial sampling throughout the mainland U.S. The screening phone interview asked if the respondent, alone or with others, was currently trying to start a new business in which they expected to have some ownership interest. The 3,592 respondents who met these criteria were considered eligible for the follow-up interview. A random subsample of 1,164 respondents was selected, contacted, and further screened to ensure that their activity currently undertaken was not an operating business. All respondents that reported their start-up had achieved positive cash flows for greater than three months at the time of phone survey were removed, resulting in 830 entrepreneurs who were subsequently interviewed by phone in the first wave of the survey a few days later (Gartner et al. 2004).

There are several advantages to using the PSED. First, because it initially screened 64,622 individuals through a randomly stratified sample frame, the PSED is a broad sample of entrepreneurs starting new ventures. Further, the PSED public data includes weights to make them truly representative of the U.S. population (Parker and Belghitar 2006). Samples of this nature are unique due to the difficulty in identifying entrepreneurs in the start-up process and the prohibitive costs to obtain a large cross-section of entrepreneurs for surveying. Second, surveying entrepreneurs at the start of business creation overcomes potential confounding effects from survivorship biases, or unobserved previous organizational events that are systematically related to the predictor or dependent variables. Further, recall biases can influence responses when surveys are taken well after the incident of interest, as those surveyed may not be able to reliably recall their views or the environment at the inception of the ventures (Huber and Power 1985; Golden 1992). Research investigating accounting system choices by new firms has generally obtained responses many years after the event of interest, thereby exposing their findings to these potential biases. Third, PSED responses should be free of biases related to the respondent's strategic concerns. While responses to public surveys may provide the respondent with an opportunity to cheaply signal heightened commitment to potential stakeholders or improve perceived valuation of the start-up, the confidential nature of the PSED eliminates obvious reasons why the respondents would not provide a truthful response.

For this study the analysis is restricted to those respondents whose start-up effort was not performed as a requirement for an employer. This criterion, which reduced the sample to 711, excluded start-ups that were influenced by existing company policies that may have affected the accounting and reporting-related choices of the venture. Further, the analysis excluded start-ups that were a purchase or takeover of an existing business, a franchise or multi-level marketing initiative, or a start-up sponsored by an existing business. Such new business forms may have differing impacts upon the demand for more frequent financial statements. For example, franchisors may contractually impose minimum preparation and reporting requirements on all new franchisee businesses for contracting or decision-making purposes (Lafontaine and Shaw 1999; Price 1999). This criterion, which reduced the available sample to 610, resulted in only independent start-up activities, created by an individual or a team working on their own, remaining in the sample. Finally, four firms that were classified in the SIC public administration division (9100–9999) were deleted to avoid potential reporting requirements imposed by government regulation, leaving a sample of 606 start-ups.

Information regarding intended financial statement and projection preparation was solicited, along with other questions, through a mail questionnaire that the PSED undertook approximately one month after the first-wave phone interview. Of the subsample of 606, 422 respondents returned the mail survey, with 262 (387) providing non-missing responses to all (at least one) of the accounting questions asked, resulting in a response rate of 43 (64) percent. A summary of the sample construction is presented in Table 1.

At the time of survey it was observed that 232 (88.6 percent) respondents had invested their own money in the business; 116 (44.3 percent) had received income from the sale of goods and services from the business; 194 (74.1 percent) had purchased raw materials, inventory, or supplies; 82 (31.3 percent) were devoted full-time (35 or more hours per week) to the business; and 44 (16.9 percent) had filed a federal income tax return. Further, for a subset of 133 who responded, the average (median) hours devoted to the venture was 1,289 (500) at the time of survey. Respondents had, on average, 10.0 years work experience in their start-up venture's industry, 34.6 percent had been self-employed full time for at least one year during the previous 10 years, and 57.9 percent considered themselves to be a small business owner or self-employed at the time of survey.

An examination of potential sample bias between those who completed the mail questionnaire and those who did not or did not complete the accounting questions asked, revealed statistically significant differences only for product development ($t = 2.06$, $p < 0.04$), with responders being in start-ups with greater levels of product development than nonresponders, and for respondent accounting experience ($\chi^2 = 9.61$, $p < 0.01$), with 55.2 percent of responders having some accounting or financial control experience compared to 39.0 percent of nonresponders.

TABLE 1
Sample Construction

	Number
Start-ups identified from phone survey	830
Minus	
Start-ups done as a part of your current job for an employer	119
Start-ups that were franchises, purchase or takeovers of existing businesses, or business sponsored	101
Start-ups in public administration (SIC 9100–9999)	4
Start-ups eligible for mail questionnaire	606
Minus	
Respondents who declined to participate in mail questionnaire	7
Respondents who did not return mail questionnaire	177
Respondents who provided missing responses to any accounting questions	160
Final sample of start-ups	262
Minus	
Respondents who provided missing responses to any dependent variables	62
Sample of start-ups used in main results	200

Table 2 reports the industry membership of the study's start-up ventures. Also reported in the table are the estimated population weights, which were determined from the sample of 830 entrepreneurs surveyed by the PSED by multiplying respondent weight by industry classifications. The sample ventures are primarily clustered in the services (49.6 percent) and retail industries (22.5 percent). Although the sample is skewed toward certain industries, the distribution is comparable to that of the estimated population, and likely representative of the population of start-up ventures. Table 2 also depicts the industry membership by SIC major groups (two-digit code) for all industries with ten or greater firms in the sample. The three industries represented most frequently in the sample are business services (7300–7399, n = 44), miscellaneous retail (5900–5999, n = 30), and personal services (7200–7299, n = 22). Although not reported, the four-digit SIC codes that appear most frequently in the sample are eating places (5812, n = 12), real estate agents (6531, n = 9), miscellaneous business services (7389, n = 9), and child day care services (8351, n = 9), suggesting that even within industries there is a large variation in the start-up activities in the sample. The industry composition in this study's sample is markedly different from other studies investigating accounting systems or reporting choices in early stage ventures, with most study samples clustered in specific industries (Granlund and Taipaleenmaki 2005; Moores and Yuen 2001). For example, over 60 percent of the sample firms of Davila and Foster (2005) were in information technology industries, while 58.7 percent of Sandino's (2007) sample firms were eating and drinking establishments.

Independent Variables: Measurement and Descriptive Statistics

Table 3 provides operational definitions and descriptive statistics for the sample of start-ups. The descriptive statistics reflect the sample of 262, however, the various multivariate analyses were limited to the respondents who provided non-missing values to all independent and dependent variables. The reduction in sample for the multivariate analyses is primarily driven by questions relating to future size, which were answered by only 219 respondents in the available sample.[1]

Outside owner is represented by an indicator variable coded 1 if another person, other than the entrepreneur's spouse, would legally own the business, or 0 otherwise. The additional non-spousal criterion was enacted to better capture whether the venture intended to have legal owners who were at arms' length. Of the sample start-ups, 23.5 percent had or intended to have outside owners. Outside funding is represented by an indicator variable coded 1 if the respondent has asked or will ask others or institutions for funds, and 0 otherwise. Of the sample, 43.1 percent did or intended to access outside financing. Table 3 also reports the number of start-ups that have asked for bank and venture capital funding.

Three questions assessed the extent to which the start-up makes intangible investments. Responses to these questions were coded 1 for yes, and 0 otherwise and averaged to obtain each firm's intangible asset score. The first question asked whether the firm intended to (or had) submit a patent, copyright, or trademark application, and 32.1 percent of the sample indicated that they did. The second question asked if spending money on research and development was a major priority for the start-up, and 27.9 percent responded that it was. The third question asked whether the new business was considered high-tech, and 31.9 percent of the sample responded in the affirmative.

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[1] The PSED obtained responses on many venture and respondent characteristics. One problem with the PSED is that many of the questions were asked only to a subset of the sample, particularly in regard to venture funding and investment. Therefore, several of these variables are not reported in the descriptive statistics or used as predictor variables.

TABLE 2
Industry Membership and Statement Preparation of Sample Start-Ups

Industry Classification	SIC Code	Number	Sample Weight (%)	Estimated Population Weight (%)	Income Statement Monthly Preparation (%)	Cash Flow Monthly Preparation (%)	Balance Sheet Monthly Preparation (%)	Sales Forecast Monthly Preparation (%)
SIC Divisions								
Agriculture, Forestry, and Fishing	0100–0999	7	2.67	3.93	67	57	67	50
Construction	1500–1799	12	4.58	6.52	60	58	45	33
Manufacturing	2000–3999	14	5.34	5.84	79	86	86	43
Transportation and Utility	4000–4999	6	2.29	2.75	20	17	25	0
Wholesale	5000–5199	8	3.05	3.05	63	63	13	13
Retail	5200–5999	59	22.52	24.04	63	81	61	40
Finance, Insurance, Real Estate	6000–6999	18	6.87	5.70	65	72	53	29
Services	7000–8999	130	49.62	45.90	54	59	49	25
Missing (Public Administration)	9100–9999	8	3.05	1.82	63	75	71	25
				0.45				
Total		262	100.00	100.00	61	66	57	32
SIC Major Groups (10 or greater)								
Business services	7300–7399	44	16.79	17.08	60	66	51	25
Miscellaneous retail	5900–5999	30	11.45	13.05	57	87	75	45
Personal services	7200–7299	22	8.40	5.86	37	45	37	19
Eating and drinking places	5800–5899	13	4.96	4.14	69	77	38	46
Social services	8300–8399	12	4.58	2.85	73	67	73	25
Real estate	6500–6599	11	4.20	2.77	50	64	50	40
Amusement and recreation services	7900–7999	11	4.20	4.17	60	64	55	50
Health services	8000–8099	10	3.82	2.12	44	40	33	11

TABLE 3
Descriptive Statistics and Definitions of Variables of Sample Start-Ups

Panel A: Categorical Variables

Variable	Definition	Response	Coding	Freq	%
Competition	Has the competition been/Do you expect the competition to be:	No competition	0	7	2.7
		Low	1	85	32.4
		Moderate	2	91	34.7
		Strong	3	79	30.2
Outside funding	Have (will) others or financial institutions been (be) asked for funds?	No	0	149	56.9
		Yes	1	113	43.1
Outside owners	Does (will) the firm have multiple owners who were at arm's length?	No	0	195	76.5
		Yes	1	60	23.5
Lower price importance	Importance of lower prices for the new firm to be an effective competitor:	Insignificant	1	58	22.4
		Marginal	2	81	31.3
		Important	3	71	27.4
		Critical	4	49	18.9
Growth intention	Which best describes your preference for the future size of this business?	Manage by self	0	211	80.8
		Large as possible	1	50	19.2
Product development	What stage of development is the product or service this start-up will be selling?	No work done/ idea stage	1	38	14.8
		Being developed	2	56	21.9
		Tested with customers	3	53	20.7
		Completed and ready	4	109	42.6
Employment of non-owners	Have (will) any employees be hired for pay—workers who would not share ownership?	No	0	117	44.7
		Yes	1	145	55.3
Accounting experience	Any work experience in accounting and financial control	None	0	113	44.8
		Some	1	139	55.2
Accounting courses	Number of courses taken in accounting and financial control	None	0	123	51.0
		Some	1	118	49.0
Form of organization	What is (will be) the legal form of the new business?	Unlimited liability	0	215	83.3
		Limited liability	1	43	16.7
Patent	Has (will) a patent, copyright, or trademark application been (be) submitted?	No	0	178	67.9
		Yes	1	84	32.1
Research and development	Will spending money on research and development be a major priority for this new business?	No	0	189	72.1
		Yes	1	73	27.9
High tech	Would you consider this new business to be hi-tech?	No	0	177	68.1
		Yes	1	83	31.9

(*continued on next page*)

TABLE 3 (continued)

Variable	Definition	Response	Coding	Freq	%
Venture capital	Have venture capitalists been asked for funding for this new firm?	No	0	252	96.2
		Yes	1	10	3.8
Bank	Has a bank been asked for funding for this new firm?	No	0	228	87.0
		Yes	1	34	13.0
Business planning	Has a business plan been prepared for this start-up?	No	0	98	37.4
		Yes	1	164	62.6
Team	Has (will) a start-up team been (be) organized?	No	0	99	37.8
		Yes	1	163	62.2
Financial Projections	Have projected financial statements been developed?	No	0	154	58.8
		Yes	1	108	41.2

Panel B: Continuous Variables

Variable	Definition	Mean	Median	Standard Deviation
Expected sales growth	Intended annualized sales growth of the venture between one to five years of operation	0.40	0.32	0.39
Log of predicted sales at year 1	Log 10 of the expected total sales, revenues, or fees from the first full year of operation	4.54	4.52	0.97
Log of predicted sales at year 5	Log 10 of the expected annual total sales, revenues, or fees in the fifth year of operation	5.11	5.00	0.94
Intangible	The sum of dichotomous variables: patent, research and development, and high-tech; divided by 3.	0.31	0.33	0.30

Level of competition is obtained through the respondent's perception of the start-up's likely competition, on a four-point scale, namely: (0) no competition; (1) low; (2) moderate; or (3) strong. Low price importance is based on the respondent's rating of the importance of maintaining lower prices for the new firm to be an effective competitor, again using a four-point scale: (1) insignificant; (2) marginal; (3) important; and (4) critical.

Product development is represented by the respondent's perception of the stage of development of the start-up's product or service, namely: (1) no work done/idea stage; (2) being developed; (3) tested with customers; (4) completed and ready. At the time of the survey, 42.6 percent of start-ups had a completed and ready product or service.

Size of the business is the respondent's expectation of total sales or revenues to be achieved in the first full year of operation. Intended measure of business size is a less noisy measure of scale than the actual measure of scale at the point of survey, given the variation in resource acquisition during the start-up phase across firms. The size variable is log transformed due to skewness of the untransformed variable.

Examining respondent accounting background, approximately 49 percent of the sample of entrepreneurs had taken at least one accounting course, and 55 percent had experience working with some accounting or financial control functions. All the independent variables, except for accounting experience and coursework, were obtained from the first wave phone interview.

Contrasting the characteristics of this study's sample with those of the samples from previous studies on early-stage firm accounting decisions again reveals substantial differences. For example, only 4 percent of the sample start-ups in the current study plan to obtain or have obtained funds from venture capitalists, compared with 26 percent in Sandino (2007) and 77 percent in Davila and Foster (2005). The low proportion of firms accessing venture capital financing is consistent with empirical evidence that has investigated the financing of new and small firms (Berger and Udell 1998; Cassar 2004).

Dependent Variables: Measurement and Descriptive Statistics

The dependent variables in this study are the intended frequencies of financial statement and projection preparation at the beginning stage of start-up ventures. The financial statement measures were solicited from the first mail survey.[2] Using different instruments to obtain the dependent variable measures and the independent variables reduces the potential sources of common method biases such as item context effects, when respondents ascribe to an item solely because of its relation to other items in the instrument; and measurement context effects, when predictor and criterion variables are measured at the same point in time or using the same medium (Podsakoff et al. 2003). Specifically, for each of the financial statements, namely, cash flow statement, income statement, and balance sheet, the PSED asked the respondents how often they expected to prepare the statement for the new business. The available responses were: (0) never or not relevant; (1) once a year; (2) every 6 months; (3) every 3 months; and (4) every month. The descriptive statistics of these responses are reported in Table 4. Interestingly, 66 percent of the sample ventures intended to produce cash flow statements on a monthly basis, as opposed to 61 percent and 57 percent for income statements and balance sheets, respectively. The greater perceived need for cash flow statements is consistent with the importance of cash flow and liquidity in the early stages of business ventures. Further, there is a substantial correspondence in the frequency of intended financial preparation across financial statements. For example, 75 percent of the sample had the same intended frequency of preparation for both the income statement and cash flow statement.

TABLE 4
Preparation of Statements by Sample Start-Ups

Frequency	Income Statement (%)	Cash Flow Statement (%)	Balance Sheet (%)	Sales Forecast (%)
0. Never/Not relevant	2.7	7.6	8.4	29.0
1. Once a year	16.4	11.4	13.7	8.8
2. Every 6 months	4.6	3.4	3.8	11.5
3. Every 3 months	15.7	11.5	17.2	19.0
4. Every month	60.7	66.0	56.9	31.7
Total	100.0	100.0	100.0	100.0

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[2] To investigate the timing of the mail survey relative the start of the operation of the new venture, respondents were asked in future waves through phone survey to provide the date that they considered the start-up to be an operating business, as self-defined by the respondent. For the 101 responses available from future phone interviews, the mail survey was a mean (median) 0.7 (2) months before when the start-up became an operating business.

Panel A of Table 5 reports the Pearson correlations among the three financial statement preparation variables. All three variables are highly positively correlated with one another ($p < 0.001$). A principal component factor analysis was undertaken to extract a common factor related to financial statement preparation. Panel B provides a summary of the factor analysis results. The first factor explained 75 percent of the correlation among the three variables, and was the only factor with an eigenvalue greater than 1 (2.24). Given the ability of this one factor to explain variation in the preparation of all three financial statements, I retain this factor, labeled *FINSTAT*, using the scoring coefficients obtained as the dependent variable. Panel C reports that the Pearson correlations between the financial statement variables and *FINSTAT* range from 0.84 to 0.89.

The financial projection measures used in this study are: (1) sales forecasts and (2) projected financial statements. The intended preparation of sales forecasts was obtained from the same question stem that elicited the financial statement responses on the mail questionnaire, and its value is based directly on the response.[3] Table 4 reports that while over half of the sample ventures planned to prepare financial statements on a monthly basis, only 32 percent intended to prepare sales forecasts on a monthly basis.

Whether projected financial statements, such as income and cash flow statements, were developed for the start-up venture was obtained from the first-wave phone interview. Importantly, the financial projection variable only captures if financial projections have been

TABLE 5
Principal Factor Analysis of Preparation of Financial Statements

Panel A: Pearson Correlations between Preparation of Financial Statements

Statement Type	Income Statement	Cash Flow Statement
Income statement		
Cash flow statement	0.69**	
Balance sheet	0.62**	0.58**

Panel B: Principal Factors (One Factor Retained)

Factor	Eigenvalue	Proportion Explained	Cumulative Proportion
1	2.24	0.75	0.75
2	0.44	0.15	0.89
3	0.32	0.11	1.00

Panel C: Scoring Coefficients of Retained Factor (Factor 1 in Panel B) and Correlations

Variable	Standardized Scoring Coefficient	Pearson Correlation
Income statement	0.40	0.89**
Cash flow statement	0.39	0.87**
Balance sheet	0.37	0.84**

** Significant at 0.01 level.

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[3] An alternative empirical approach was to include the sales forecasts in the factor analysis with the three financial statements and extract a factor for financial statement preparation and projection preparation. In unreported results, this approach was successful in obtaining two distinct factors for feed-back and feed-forward information, based on a 0.30 factor loading cut-off.

completed, and not if they are planned to be done in the near future. At the time of the survey, 41 percent of the start-ups had developed projected financial statements.

The correlations among the study variables are presented in Table 6. Several of the independent variables are significantly correlated with one another. For example, outside funding is significantly correlated with outside owners, intangible investment, log (predicted sales), limited liability, venture capital, and product development ($p < 0.05$). These strong correlations may lead to multicollinearity issues. Throughout the multivariate analyses, I examined the variance inflation factor (VIF) and the condition index. At no time did these reach levels consistent with harmful collinearity (Kennedy 2003).

IV. RESULTS

Examination of Financial Statement Preparation Frequency Choice

Given the discussions in the previous sections, I model the determinants of financial statement preparation using ordinary least-squares, as presented below:

$$\begin{aligned} FINSTAT = {} & \alpha + \beta_1 Outside\ Owners_j + \beta_2 Outside\ Funding_j \\ & + \beta_3 Lower\ Price\ Importance_j + \beta_4 Competition_j \\ & + \beta_5 Accounting\ Experience_j + \beta_6 Product\ Development_j \\ & + \beta_7 Intangible_j + \beta_8 \mathrm{Log}(Predicted\ Sales)_j \\ & + \beta_9 Limited\ Liability_j + \beta_{10} Venture\ Capital_j + \varepsilon_j \end{aligned} \tag{1}$$

Table 7 presents the summary statistics and coefficients from Equation (1). The overall predictive power of the model is reasonable, with the independent variables explaining 18.5 percent of the observed variation in intended financial statement preparation. Consistent with hypothesized arguments that greater competition creates a greater demand for accounting information, competition is observed to be positively related to intended financial statement preparation frequency ($\beta = 0.19$, $p < 0.01$). Also, I find product development to be negatively related to intended frequency of financial statement preparation ($\beta = -0.11$, $p < 0.05$). This relationship is consistent with greater uncertainty of costs and profitability of the start-up ventures products or services increasing the demand for more frequent accounting information. I find outside funding sought to be positively related to intended frequency of financial statement preparation ($\beta = 0.25$, $p < 0.05$). This is consistent with the owner-financier relationship creating agency problems that can be partially reduced by the firm providing periodic information about the venture's financial position and operation. There is also a positive relation between the intended frequency of financial statement preparation and venture scale ($\beta = 0.21$, $p < 0.01$).

Comparing the relative economic significance of competitive and contracting influences suggests that competition is more influential in explaining variation in intended frequency of financial statement preparation. For example, new ventures with outside owners and outside funding, holding all other variables at their means, have an intended financial statement preparation factor (mean 0, standard deviation 1) 0.339 greater than new ventures that have no outside owners or outside funding. While new ventures with strong perceived competition have an intended financial statement preparation factor 0.379 (0.569) greater than new ventures that have low (no) perceived competition. Further, simultaneously varying price importance and competition increases these differences. For example, new ventures with strong competition and critical price importance have a factor 0.662 (0.863)

TABLE 6
Pearson and Spearman Correlations between Variables[a]

	1	2	3	4	5	6	7	8	9	10	11	12
1. *FINSTAT*		0.53**	0.17*	0.24**	0.11	0.20**	0.05	−0.19**	0.20**	0.26**	0.06	0.07
2. *Sales forecast*	0.51**		0.17*	0.15	−0.02	0.18*	0.08	−0.10	0.24**	0.15*	0.08	−0.01
3. *Outside owners*	0.14	0.16*		0.17*	−0.01	0.08	−0.00	−0.11	0.18**	0.32**	0.19**	0.09
4. *Outside funding*	0.22**	0.15*	0.17*		−0.07	−0.03	−0.07	−0.16*	0.23**	0.25**	0.22**	0.25**
5. *Lower price importance*	0.10	−0.02	0.01	0.07		0.08	−0.03	−0.00	0.09	−0.05	−0.10	−0.08
6. *Competition*	0.18*	0.16*	0.08	−0.02	0.07		−0.07	−0.04	0.09	0.02	0.00	−0.01
7. *Accounting experience*	0.03	0.07	−0.00	−0.07	−0.03	−0.07		0.05	0.01	−0.08	0.01	0.02
8. *Product development*	−0.19**	−0.12	−0.12	−0.08	−0.00	−0.03	0.03		−0.27**	−0.04	0.07	−0.02
9. *Intangible*	0.21**	0.22**	0.16*	0.23**	0.09	0.11	0.02	−0.30**		0.04	−0.01	0.07
10. *Predicted sales at year 1*	0.21**	0.17*	0.29**	0.35**	−0.03	0.04	−0.04	−0.06	0.14*		0.23**	0.14*
11. *Limited liability*	−0.01	0.07	0.19**	0.22**	−0.10	0.00	0.01	0.06	0.00	0.31**		0.00
12. *Venture capital*	0.09	−0.01	0.09	0.25**	−0.08	−0.01	0.02	−0.03	0.07	0.16*	0.00	

*, ** Significant at $p = 0.05$ and $p = 0.01$, respectively. Coefficients with absolute values greater than 0.138, 0.182, and 0.231 are significant in two-tailed tests at 0.05, 0.01, and 0.001, respectively.

[a] n = 200 for all correlations. Pearson correlations are displayed in the top right, Spearman correlations are displayed in the bottom left.

TABLE 7
Financial Statement Preparation Frequency[a]

	FINSTAT		
Independent Variables	**Coefficient**		**t-value**
Outside owners	0.09		0.55
Outside funding	0.25*		1.80
Lower price importance	0.08		1.33
Competition	0.19**		2.58
Accounting experience	0.19		1.51
Product development	−0.11*		1.87
Intangible	0.28		1.23
Log of predicted sales at year 1	0.21**		3.02
Limited liability	−0.03		0.19
Venture capital	0.01		0.04
Intercept	−1.46		3.44
R^2 (%)		0.185	
Adjusted R^2 (%)		0.142	
F-statistic		4.30**	
Condition index		23.7	
Observations		200	

*, ** Significant at 0.05 and 0.01 levels (two-tailed).

[a] Table reports ordinary least-squares estimation. Independent variables defined in Table 3.

greater than new ventures with low (no) competition and insignificant price importance.[4] Overall, the results are consistent with both contracting and decision-making benefits from voluntary financial statement preparation; however, decision-making benefits to reduce competitive and fundamental uncertainty appear to be of greater importance.

Examination of Preparation Frequency for Separate Financial Statements

The institutional requirement that mandated financial reporting includes multiple financial statements presumes that each statement fulfills different roles, or at least provides information incremental to each other (Barth et al. 1998). In particular, the income statement reports the firm's operational results over a period, providing information about the rents associated with the firm's abnormal earnings opportunities. The balance sheet provides information about a firm's financial position at a point in time, thereby facilitating loan decisions and debt monitoring by providing information about liquidation values. The statement of cash flows provides further information concerning the firm's use of cash and liquidity. Given the information contained in the alternative financial statements, I supplement the analysis for financial statement preparation with separate examinations of the income statement, cash flow statement, and balance sheet.

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[4] Comparing these contracting and decision-making benefits through a one standard deviation change surrounding the means reveals similar relative effects, with a standard deviation increase in outside owners and outside funding increasing the financial statement preparation factor by 0.135, while a standard deviation increase in competition and price importance results in a 0.261 increase.

Table 8 reports the summary of estimation results for separate financial statement preparation frequency. Estimation was performed using ordinal logit regression due to the ordinal nature of the dependent variables. I found that greater perceived competition was significantly positively related to both flow statements, namely, the income statement ($\beta = 0.39$, $p < 0.05$) and cash-flow statement ($\beta = 0.39$, $p < 0.05$); however, competition was not positively related to balance sheet preparation. These differences suggest firm competition significantly increases the demand for flow statement information, but does not increase the demand for financial position information. These results are consistent with the decision-making benefits provided by the flow statements allowing entrepreneurs to assess the profitability and cash usage of the venture, which appears to be heightened in more competitive environments.

Examining other determinants of intended cash flow statement preparation reveals that intangible investments are positively related to cash flow statement preparation, while product development stage is negatively related to preparation. Both these coefficients suggest that cash flow information is particularly important for start-ups that have high uncertainty concerning their goods or services and for those start-ups that have intangible investments, which are more uncertain than tangible assets in regard to future cash flow outcomes (Kothari et al. 2002). I observed similar signs for these predictor variables for the other financial statements; however, the magnitudes were smaller and statistically insignificant.

The presence of outside owners was also observed to be positively related to intended cash flow statement preparation frequency, consistent with the agency problems prompting the preparation of cash statements for contracting and monitoring purposes in start-up firms

TABLE 8
Individual Financial Statement Preparation Frequency[a]

	Income Statement		**Cash Flow Statement**		**Balance Sheet**	
Independent Variables	**Coefficient**	**Std. Error**	**Coefficient**	**Std. Error**	**Coefficient**	**Std. Error**
Outside owners	−0.17	0.37	0.97*	0.48	0.12	0.37
Outside funding	0.67*	0.33	0.14	0.36	0.49	0.32
Lower price importance	0.17	0.15	0.10	0.16	0.18	0.14
Competition	0.39*	0.17	0.39*	0.19	0.25	0.17
Accounting experience	0.36	0.29	0.10	0.32	0.43	0.29
Product development	−0.11	0.14	−0.46**	0.16	−0.11	0.14
Intangible	0.78	0.53	1.22*	0.62	0.50	0.52
Log of predicted sales at year 1	0.41**	0.16	0.42**	0.17	0.48**	0.16
Limited liability	−0.30	0.39	−0.03	0.44	−0.62	0.37
Venture capital	0.07	0.78	0.23	0.89	−0.08	0.72
n	200		200		200	
−2 Log likelihood	417.27		379.52		469.91	
Pseudo R^2	0.13		0.19		0.13	
χ^2	27.01**		42.22**		27.07**	

*, ** Significant at 0.05 and 0.01 levels (two-tailed).

[a] Individual intercepts not reported. Independent variables defined in Table 3.

($p < 0.05$). Alternatively, I found that outside funding was a significant determinant of intended income statement preparation. This highlights the financial institutions' reliance on income statements in the contracting and monitoring process involving start-up ventures.

Examining balance sheet preparation frequency determinants, aside from scale effects ($p < 0.01$), I find no support for other contracting or information influences on intended balance sheet preparation frequency. This suggests that either the underlying forces affecting balance sheet preparation around start-up are captured solely through scale effects or that these other contracting or information forces are not as important as the forces underlying the preparation of balance sheets by new ventures. It is possible that internal and external users do not demand information concerning the financial position of the venture because of the relatively low liquidation values associated with venture discontinuance, compared to the critical importance of cash flow and determination of profitability in the early stages of the venture.

Examination of Preparation Frequency for Forecasts and Projections

Table 9 presents the models predicting the start-up characteristics associated with the preparation of forward-looking information. The ordered logit results for sales forecast reveal that intangible investments are an important determinant of intended financial projection preparation ($\beta = 1.12$, $p < 0.01$). This equates to a 47.4 (22.8) percent likelihood of intending to prepare monthly sales forecasts in new ventures with high (no) intangible investment. This result is in contrast to the findings for traditional financial statements, where intangible investments had limited association with the frequency of preparation. Further, competition was found to be positively related to the sales forecast frequency (β

TABLE 9
Financial Projection Preparation[a]

	Sales Forecast (Ordinal Logistic Regression)		**Financial Projections (Logistic Regression)**	
Independent Variables	**Coefficient**	**Std. Error**	**Coefficient**	**Std. Error**
Outside owners	0.29	0.33	0.08	0.40
Outside funding	0.36	0.29	0.56	0.34
Lower price importance	−0.11	0.13	0.22	0.16
Competition	0.32*	0.15	−0.04	0.19
Accounting experience	0.38	0.26	−0.34	0.32
Product development	−0.04	0.12	−0.02	0.15
Intangible	1.12**	0.47	1.59**	0.59
Log of predicted sales at year 1	0.20	0.14	0.51**	0.19
Limited liability	0.00	0.34	0.96*	0.43
Venture capital	−0.70	0.62	0.69	0.79
n	200		200	
−2 Log likelihood	581.82		229.41	
Pseudo R^2	0.11		0.20	
χ^2	23.91**		43.92**	

*, ** Significant at 0.05 and 0.01 levels (two-tailed).

[a] Individual intercepts not reported. Independent variables defined in Table 3.

$= 0.32$, $p < 0.05$). New ventures with strong competition have a 36.9 percent likelihood of intending to prepare monthly sales forecasts, compared to a 23.7 (18.4) percent likelihood for new ventures with low (no) competition. The findings are consistent with the benefits of sales forecasts increasing in the environmental uncertainties reflected by the perceived level of competition and the intangibility of the ventures' assets, including patents, research and development, and involvement in high-tech business. Further, these results can be contrasted to the economic influence of outside funding on sales forecast frequency, with the likelihood of intended preparation of monthly sales forecasts increasing from 26.0 percent to 33.6 percent for those without and with outside funding, respectively. Interestingly, the scale effects that I observed to be strong predictors of financial statement preparation were not significantly related to sales forecast preparation.

The right-side columns of Table 9 present the logit estimation of the presence of financial projections. It is important to note that this dependent variable measures the current existence of financial projections rather than a frequency of preparation. Consistent with the sales forecast results, I again find that intangible investment is positively related to financial projection preparation ($\beta = 1.59$, $p < 0.01$). This relationship is economically significant. The probability of having financial projections is 30.9 percent for ventures with no intangible investment and 68.7 percent for ventures with high intangible investment. In addition, I find limited liability to be positively correlated with the existence of financial projections ($\beta = 0.96$, $p < 0.05$). Unlike sales forecast preparation, scale is again observed to be significantly positively associated with information preparation. While the sign on both outside funding and venture capital is positive, neither is significantly different from zero. Overall, financial projection preparation appears to be significantly positively associated with intangible investment.

Robustness

To evaluate the robustness of the findings, I repeat the analyses above altering the sample selection and sample weighting. First, I investigate the influence of sample requirements on the inferences found. In particular, I remove the requirement that the venture be a new venture, thereby allowing the venture to be a purchase or takeover of an existing business, or a franchise initiative. I also remove the requirement that the start-up effort be undertaken solely by the respondent, thereby including ventures that may have developed through employment or directly from an employer. By relaxing these two requirements, the sample size available for analysis is 274. Table 10 presents the results from the broader start-up analyses, which are generally consistent with the empirical findings of the more restricted sample requirements and hypothesized arguments for both financial and forward-looking statements. The similarities in the inferences suggest that the main results are likely to be generalizable across all new venture activities, and not solely unique to independent start-ups.

Second, I repeat the analyses using the population weights of all start-ups. The use of weights may be important, as the PSED sampling frame deliberately over-represents particular entrepreneur groups such as females and minorities (Gartner et al. 2004). The weightings allow for the determination of the coefficients as representative of all U.S. start-ups. In results not reported, the economic magnitude and statistical significance of the explanatory variables are invariant to the use, or non-use, of population weights.

Third, a potential concern of the study was the surveying of new entrepreneurs, some of whom may not know the benefits and costs of the financial statements and projections. To examine the extent to which the results are driven by participants who may not know

TABLE 10
Preparation Frequency for Less Restrictive Sample Criteria[a]

	FINSTAT (Ordinary Least-Squares)		Sales Forecast (Ordinal Logistic Regression)		Financial Projections (Logistic Regression)	
Independent Variables	**Coefficient**	**Std. Error**	**Coefficient**	**Std. Error**	**Coefficient**	**Std. Error**
Outside owners	0.21*	0.13	0.23	0.27	0.06	0.33
Outside funding	0.22*	0.12	0.09	0.24	0.67*	0.28
Lower price importance	0.12*	0.05	0.02	0.11	0.11	0.13
Competition	0.18**	0.06	0.26*	0.13	−0.05	0.16
Accounting experience	0.24*	0.11	0.50*	0.23	−0.10	0.27
Product development	−0.13**	0.05	−0.20	0.11	0.11	0.13
Intangible	0.09	0.18	0.90*	0.38	1.43**	0.46
Log of predicted sales at year 1	0.15**	0.06	0.25*	0.12	0.39**	0.15
Limited liability	−0.02	0.14	0.32	0.29	0.72*	0.35
Venture capital	0.01	0.24	−0.14	0.51	0.43	0.62
n	274		274		274	
Adjusted R^2 (%)	0.164					
F-stat	5.16**					
−2 Log likelihood			792.70		330.40	
Pseudo R^2			0.12		0.15	
χ^2			34.86**		45.54**	

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*, ** Significant at 0.05 and 0.01 levels (two-tailed).

[a] Individual intercepts not reported. Independent variables defined in Table 3.

the costs or benefits of accounting information because they are too early in the venturing process, I reperformed the results for the subsample of firms that had achieved sales at the time of survey. These unreported results suggest that competition is associated with financial statement frequency, and competition and intangibles are associated with sale forecast frequency, both consistent with the original findings. Therefore, the results suggest that even for the more developed start-ups, where knowledge of the costs and benefits of accounting information production is more likely, similar influences are associated with financial statement and projection frequency.

Fourth, to examine the potential for the results being affected by the less sophisticated individuals, I included in the regressions a self-employment experience dummy variable that equaled 1 if the respondent had been self-employed full time for at least one year during the previous ten years, and 0 otherwise. The unreported results suggest that recent self-employment experience is not associated with financial statement frequency, and inclusion of this variable does not affect the original inferences. Also, it should be noted that even given potential concerns about less sophisticated entrepreneurs making accounting information production decisions, it is still observed that contracting and decision-making influences affect their accounting information production choices.

V. CONCLUSION

Using a sample of entrepreneurs who are in the process of starting a business, this study investigates the determinants of financial statements and projections preparation frequency by new business ventures. The examination at the point of venture creation helps mitigate the confounding effects from previous unobserved organizational events and recall biases affecting study inferences. I find that intended frequency of financial statement preparation is positively related to the use of outside funding, level of competition, and level of expected sales and negatively associated with the stage of product development. While these findings are consistent with information economics and contracting benefits, evaluating their economic significance suggests that decision-making benefits to reduce competitive and fundamental uncertainty are more influential in explaining variation in intended financial statement preparation. Further, I find that stronger perceived competition is associated with the intended frequency of both income statement and cash flow preparation; however, there is a lack of support for information or contracting explanations influencing intended frequency of balance sheet preparation.

In contrast to financial statements, the preparation of formal financial projections and regular sales forecasts is positively associated with the importance of intangible assets, such as patents, research and development, and those ventures in high-tech industries. I also found competition to be positively related to intended sales forecast preparation. The association between financial projections and forecasts and intangibility of assets and greater competition demonstrates that as uncertainty of the future increases, so does the desire to develop predictions that can be employed to evaluate future performance.

The primary finding from this study is that accounting information production choices at the firm's inception appear to be related to entrepreneurs' attempts to understand fundamental and competitive uncertainty to enable venture success rather than related to stewardship or valuation demands. The relative importance of non-stewardship influences is present for both financial statement and projection preparation.

There is substantial scope for future research in this domain. Future research can examine how frequency of preparation and reporting, and their associated benefits, may change over time as the venture changes scale, lifecycle, strategy, or use of financing (Moores and Yuen 2001). For example, while entrepreneurs may perceive a need for timely preparation of financial statements, this need may be weakened, heightened, or even contractually enforced when negotiating and contracting with outside financiers or as the firm's organizational structure evolves. Further, accounting information production is one component of the broader issue of what determines accounting system development, sophistication, and resource allocation. We have little understanding of how the detail and frequency of financial reports, internal controls, or accounting resources inside and outside the firm are complements or substitutes, and what determines their adoption and sophistication.

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Exchange Guidance is the Fundamental Demand for Accounting

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I. INTRODUCTION

> (B)usinessmen and their bookkeepers, working within the limits of their tradition, have for a very long time been *living* a theory of profit ... (A) business enterprise is more basically an economic unit than it is a legal institution; finance and debt are secondary to the primary economic activity of producing an output which will be acceptable to customers. (emphasis in original)
>
> —A. C. Littleton (1937, 16)

I argue that there is a fundamental demand for accounting at the origin of a firm, which I label the *exchange guidance demand* for accounting. Exchange guidance naturally results from an entrepreneur's intentions to discover and act upon opportunities for profitable economic exchange. The importance of this hypothesis is considerable since it provides a central role for accounting in expanding the scale, scope, and complexity of economic exchange, which Adam Smith (1976 [1776], 17) asserts to be the ultimate source of human economic development.

To illustrate, Figure 1 shows a timeline of events for a hypothetical business. An entrepreneur first starts up a new retail store in a tax-free zone. This business is financed with the entrepreneur's personal savings, and subsequent investment for the next several years will come either from additional investments of personal savings or the retention of internally generated cash flows. The business is a sole proprietorship, and the entrepreneur has no plans to take on additional partners or a manager in the near future.

When new retail outlets are opened (event #2), the entrepreneur decides on the new stores' locations and hires a manager for each store. A bank loan is sought to finance further expansion (event #3), the entrepreneur retires and hires a new CEO (event #4), and the firm goes public and is listed on a stock exchange (event #5). When will the entrepreneur find it beneficial to use an accounting system to record transactions and produce financial statements? The issuance of equity and its trading in a public secondary market (event #5) require ongoing disclosure for valuation purposes, and the stewardship role of accounting suggests an accounting system will benefit the entrepreneur when he delegates decision authority to subordinates (events #2 and #4) and seeks debt financing (event #3). But is

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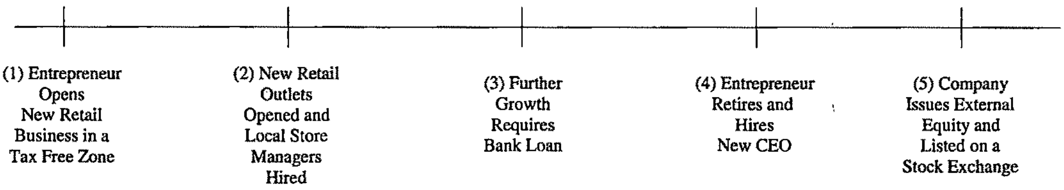
FIGURE 1
Timeline of Five Events for Hypothetical Start-Up Organization


(1) Entrepreneur Opens New Retail Business in a Tax Free Zone
(2) New Retail Outlets Opened and Local Store Managers Hired
(3) Further Growth Requires Bank Loan
(4) Entrepreneur Retires and Hires New CEO
(5) Company Issues External Equity and Listed on a Stock Exchange

there a demand for accounting when the business starts up (event #1)? At this stage, there is no valuation role for accounting, and stewardship plays no role because the firm is a sole proprietorship. Even a modest role for accounting in tax compliance is absent in this specific example. An exchange guidance demand for accounting emerges at event #1 because the entrepreneur seeks information that can help him navigate unknown product and factor markets in search of profits.

The contribution of the two studies on which I am commenting is that they remind us that stewardship and valuation are secondary demands for accounting that arise only in more complex organizations and markets. The initial, and most fundamental, demand for accounting arises when entrepreneurs seek to profitably design, produce, market, and deliver products and services to customers. In this regard, stewardship and valuation are latent demands for accounting that emerge as a consequence of organizational development enabled in part by use of accounting information that guides competitive behavior. The usefulness of accounting records becomes obvious when the entrepreneur assesses demand for various products to manage inventories and identify suppliers of products who can meet inventory needs with quality products in a cost efficient manner. This demand has been recognized for centuries; for example, Cotrugli (1961 [1458], 375), as quoted in Carruthers and Espeland (1991, 44) writes:

> Mercantile records are the means to remember all that a man does, and from whom he must have, and to whom he must give, and the costs of wares, and the profits, and the losses, and every transaction on which the merchant is all dependent. And it should be noted that knowing how to keep good and orderly records teaches one to draw contracts, how to do business, and how to obtain a profit. And undoubtedly, a merchant must not rely upon memory, for such reliance has caused many persons to err.

I discuss first the nature of the contributions in the Allee and Yohn (2009) and Cassar (2009) articles, and then develop the proposition that exchange guidance provides the fundamental demand for accounting. I conclude with a discussion of the broader implications of the exchange guidance demand for accounting.

II. THE CONTRIBUTIONS OF ALLEE AND YOHN (2009) AND CASSAR (2009)

Allee and Yohn (2009) and Cassar (2009) make important contributions because they bring into clear focus the fundamental demand for accounting information in guiding economic exchange. They do so by focusing their empirical analyses on accounting use by organizations very early in their life cycle. Most empirical studies examine financial reporting by mature firms that have securities publicly traded in long established markets like NYSE and are subject to extensive reporting requirements under federal securities laws. In contrast, Allee and Yohn (2009) and Cassar (2009) use survey data to study the actual and intended use of accounting by small businesses very early in their existence.

Allee and Yohn (2009) use the data from a 2003 survey of small business owners conducted by the National Opinion Research Center on behalf of the Federal Reserve Board. Their sample of 4,004 small business owners provides responses to a series of questions about operating, investing, and financing decisions as well as the use of accounting records and financial statement data. On average, firms in the Allee and Yohn (2009) sample are about 14 years old.[1]

Allee and Yohn's (2009) findings indicate that variables related to both competitive and contracting forces are associated with the preparation of financial statements (see their Tables 5 and 6). The proxies for competitive forces include total assets (a measure of firm scale and, hence, business complexity) and sales growth. These variables, however, have no significant effect on the use of accrual accounting and auditing. The use of auditing lessens the probability of loan denial, and the use of accrual accounting is associated with a lower cost of debt financing (see their Tables 7 and 8). These findings extend to a broader context those documented in recent field research on the implications of adopting an internal accounting control system (Davila and Foster 2005; Sandino 2007).

Cassar (2009) uses survey data collected as part of the Panel Study of Entrepreneurial Dynamics. Cassar's (2009) sample includes 606 entrepreneurs *at the very first stages of business formation.* The questions posed to survey participants solicit information on the intended preparation of financial statements and projections. Cassar (2009) uses these survey responses to obtain a composite measure of the intended frequency of financial statement preparation. Cassar's (2009) findings are especially informative in two ways. First, his sample of entrepreneurs focuses primarily on income and cash flow information and ascribes less importance to the balance sheet (see his Table 8). This runs contrary to the recent views of standard-setters who assign primary importance to the balance sheet (Storey and Storey 1998). Second, and more importantly, competitive concerns exert the primary influence on the extent to which entrepreneurs plan to produce accounting information (see his Table 7). Competition also plays a more important role than contracting in explaining the preparation of sales forecasts (see his Table 9). These findings provide strong support for the hypothesis that competitive forces play an important role in accounting information production at the start up of an organization (event #1 in Figure 1).

The major contribution of these studies is that they provide direct evidence that a demand exists for accounting information to guide management decisions that is independent of stewardship and valuation demands. Accounting scholars have long recognized that accounting information serves as a competitive tool to facilitate managerial decisions; Vatter (1950, 2–3), for example, writes: "By and large, however, the fundamental and most important uses of accounting are bound up with the operations of management" (see also Demski and Feltham 1976; Simons 1987; Ittner and Larcker 2001). The use of accounting information for managerial planning and decision making is also routinely taught as part of management accounting courses today (Horngren et al. 2009). At the same time, the economic basis for this demand is still not fully explicated (Zimmerman 2001) and the broader implications of this fundamental demand for accounting are not appreciated. I turn now to a discussion of these issues.

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[1] Other studies have examined the adoption of management accounting systems using samples of firms at a similar stage of their life cycle. The sample in Davila and Foster (2005) includes 78 technology companies with an average age of 5.5 years. Sandino (2007) examines a sample of 97 retailers with an average age of 13.3 years.

III. THE FUNDAMENTAL DEMAND FOR ACCOUNTING IN GUIDING EXCHANGE[2]

Adam Smith (1976 [1776], 17), in stressing the central importance of exchange for economic development, penned two of the most widely cited sentences ever written by an economist:

> This division of labor, from which so many advantages are derived, is not originally the effect of any human wisdom, which foresees and intends that general opulence to which it gives occasion. It is the necessary, though very slow and gradual, consequence of a certain propensity in human nature which has in view no such extensive utility; the propensity to truck, barter, and exchange one thing for another.

The central importance of exchange has implications for how economists think about economic organization and markets, and how economies develop (Buchanan 1964; Kohn 2004; North 2005). Exchange is the foundation for the emergence of complex economies and economic institutions.

Our understanding of the importance of accounting in guiding exchange is hampered largely by the theory of perfect competition that we, like other applied economists, internalize in our undergraduate and graduate programs. The theory of perfect competition from standard neoclassical price theory is one in which firms take prices as given, and then produce to the point at which marginal cost is equated with price. The concept of equilibrium is useful because it permits comparative static analyses that allow for clean predictions about the effect of exogenous changes on equilibrium.

Friedrich Hayek (1968, 181–2) highlights a fundamental paradox inherent to the theory of perfect competition; the theory does not allow for anyone to take the kinds of actions that we associate with the actual process of competing:

> I shall return to the central subject of this lecture, by pointing out that economic theory sometimes appears at the outset to bar its way to a true appreciation of the character of the process of competition, because it starts from the assumption of a "given" supply of scarce goods. But which goods are scarce goods, or which things are goods, and how scarce or valuable they are—these are precisely the things which competition has to discover. Provisional results from the market process at each stage alone tell individuals what to look for. Utilization of knowledge widely dispersed in a society with extensive division of labor cannot rest on individuals knowing all the particular uses to which well-known things in their individual environment might be put. Prices direct their attention to what is worth finding out about market offers for various things and services. This means that the, in some respects always unique, combinations of individual knowledge and skills, which the market enables them to use, will not merely, or even in the first instance, be such knowledge of facts as they list and communicate if some authority asked them to do so. The knowledge of which I speak consists rather of a capacity to find out particular circumstances, which becomes effective only if possessors of this knowledge are informed by the market which kinds of things and services are wanted, and how urgently they are wanted.
>
> This must suffice to indicate what kind of knowledge I am referring to when I call competition a discovery procedure. Much would have to be added to clothe the bare bones of this abstract statement with concrete flesh, so as to show its full practical importance. But I must be content with briefly indicating the absurdity of the usual

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[2] The material in this section is discussed in more depth in Waymire and Basu (2008, Section 6).

> procedure of starting the analysis with a situation in which all facts are supposed to be known. This is a *state* of affairs which economic theory curiously calls "perfect competition." It leaves no room whatever for the *activity* called competition, which is presumed to have already done its task. (emphasis in original)[3]

Understanding the role of historical cost accounting in competition requires that we do two things. One is to explicate more clearly how skillful use of accounting information based on the history of a firm's consummated transactions can yield a competitive advantage. The second is to more clearly understand how use of historical accounting information can alter the dynamics of how firms, industries, and even entire economies evolve.

Accountants record transactions in journal entries, and classify and summarize transactional data in T-accounts and ledgers. Various culturally evolved conventions like Objectivity, Historical Cost, Revenue Realization, and Expense Matching guide the preparation of financial statements (Littleton 1953). Double entry bookkeeping originated in 13th century Italy (DeRoover 1955), and was summarized by Pacioli (1494) shortly after Columbus's voyage to the New World. The use of double entry expanded as the Italians entered new markets where it proved useful in evaluating performance (Littleton 1933). Sombart (1919) hypothesized that double entry propelled the development of capitalism, but we still do not fully understand whether and how the use of an organization's transactional history could enable scale and scope expansion in economic organizations.

A firm exists because the cost of organizing production within a firm is less than the cost of a series of independent transactions between subcontractors on a market (Coase 1937; Cheung 1983). The firm is a device for organizing production (broadly defined) in constant preparation for the singular act of profitably consummating exchange with a customer. Products must be advertised to increase customer awareness, prices must be set so that products are attractive to customers, costs must be managed to ensure profitability, and post-purchase customer satisfaction must be sustained to garner repeat business and favorable word-of-mouth advertising. *Organizing for profitable economic exchange with the customer is the very reason for a firm's existence.*

A firm's ability to successfully locate potential customers, convince them to buy the firm's product, and cost-effectively produce and deliver the product determines the firm's survival (Alchian 1950). Further, performing these tasks is by no means a straightforward matter. If it were, then the rate of new business failure would be near zero rather than the high frequencies actually observed.[4]

Accounting information can be used to evaluate the extent to which an entrepreneur's expectations of profitable activity have been fulfilled and, more importantly, to *learn* how profitability can be improved in the future. Accounting serves constantly to help guide exchange decisions that build a firm's competitive advantage even in the absence of any stewardship or valuation demand for accounting (Littleton 1928). Entrepreneurs make choices that in the future can be rendered ineffective by technological innovations or competitors' strategic actions that affect production costs or the availability of substitute products. The dynamics of technological innovation and strategic competitive behavior implies fundamental uncertainty where the distribution of a firm's eventual payoffs may not be knowable at least in the short run (Knight 1921). It is this uncertainty that transforms competition into a "discovery process" where the firm's survival depends on the entrepreneur's ability to successfully deal with uncertain product and factor markets (Hayek 1968). An accounting system based on a record of the firm's past transactions recorded at historical cost is thus valuable because it facilitates planning of future actions based in part on past results (Littleton 1937; Most 1973).

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[3] Hayek also discusses the issue of economic knowledge in an earlier classic article in *American Economic Review* and in his Nobel address (Hayek 1945; 1989).

[4] Approximately half of new business ventures in the U.S. do not survive more than four years (Phillips and Kirchhoff 1989), but not all of these are business failures since some businesses are acquired by other firms or owners exit while making profits (Headd 2003).

The primary implication of this view is that stewardship and valuation represent latent demands for accounting that are secondary to an exchange guidance demand. At the most basic level, the demand for recordkeeping and accounting arises when increasing complexity in economic exchange leads to the creation of transaction records outside the brain (Basu and Waymire 2006). The ability to create accurate records of exchange history provides further impetus for the development of complex beneficial exchange in primitive economies (Basu, Kirk, and Waymire 2008) and sustains reputation-based trust that orders exchange in economies reliant on reciprocity (Basu, Dickhaut, Hecht, Towry, and Waymire, forthcoming). The importance of the Allee and Yohn (2009) and Cassar (2009) studies is that they substantively demonstrate that similar forces are at play in the modern developed economies that researchers presently study.

An exchange guidance demand also provides increased clarity about the central importance of evolved accounting conventions such as Objectivity, Revenue Realization, Expense Matching, Going Concern, and Conservatism (Littleton 1953). If the goal of an entrepreneur is to ensure organizational survival, and the use of past exchange history helps achieve this goal, then it is not surprising that information should be organized with emphasis on net rewards from consummated exchange (i.e., income) and reflect circumstances under which exchange with customers was profitably consummated (Paton and Littleton 1940).[5] That is, historical cost, accrual-based accounting is an ecologically rational institution (Smith 2003). The requirements of objective transactional data derived from arm's length exchanges tempered by conservatism also check any tendencies toward optimism in making decisions about the future (see also Watts 2003a, 2003b).

IV. IMPLICATIONS FOR RESEARCH AND POLICY

The exchange guidance hypothesis is an especially important issue for further accounting research. Sombart (1919) hypothesized a role for accounting in enabling capitalism; others hypothesizing such a relation include Max Weber, Joseph Schumpeter, and Ludwig (Most 1972, 1973; Carruthers and Espeland 1991). Mises ([1998 [1949], 231) states the hypothesis broadly as:

> Monetary calculation is the main vehicle of planning and acting in the social setting of a society of free enterprise directed and controlled by the market and its prices. It developed in this frame and was gradually perfected with the improvement of the market mechanism and with the expansion of the scope of things which are negotiated on markets against money. It was economic calculation that assigned to measurement, number, and reckoning the role they play in our quantitative and computing civilization. ... Monetary calculation reaches its full perfection in capital accounting. It establishes the money prices of available means and confronts this total with the changes brought about by action and by the operation of other factors. This confrontation shows what changes occurred in the state of acting men's affairs, and the magnitude of those changes; it makes success and failure, profit and loss ascertainable. ... Our civilization

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[5] As already noted, Alchian (1950) argues that firm survival is determined by attained positive profits not maximum profits. Radner (1995) argues that aggregate outcomes from a competitive process can differ radically when firms maximize survival prospects rather than profits.

> is inseparably linked with our methods of economic calculation. It would perish if we were to abandon this most precious intellectual tool of acting. Goethe was right in calling bookkeeping by double entry "one of the finest inventions of the human mind."

An exchange guidance demand for accounting raises the intriguing possibility that basic accounting functions are a critical factor in the spontaneous market order characterized by Adam Smith (1976 [1776]) with the metaphor "Invisible Hand" (Waymire and Basu 2008).[6] This suggests that exploration of how firms, markets, and industries evolve under accounting systems of differing effectiveness in guiding market interaction is a critical area for future research. Specifically, it is desirable to directly test Sombart's hypothesis, which has two implications. The first is that systematic quantified accounting information fundamentally changes how the human brain processes information about economic exchange (see also Kadous et al. 2005). The second is that the use of better accounting information provides better guidance for exchange decisions that alter how the market "selects" firms for survival. These implications can be investigated using techniques from cognitive neuroscience experiments and agent-based modeling, respectively (see Waymire and Basu 2008, Section 6.2.2).

Neuroeconomics is an emerging new research stream that seeks to understand how the brain behaves in making economic decisions (e.g., Chorvat and McCabe 2004; Glimcher and Rustichini 2004). The first part of Sombart's hypothesis is that accounting fundamentally changes how persons approach economic exchange in impersonal markets. Prior research suggests that humans are inclined to punish those who cheat in exchange, and this is reflected in brain activity during experiments (de Quervain et al. 2004). Sombart's hypothesis suggests that accounting may change the brain's evaluation of cheating by transforming cheating from a personal affront to a business risk. Accounting would presumably implicate those areas of the brain directed more toward rational evaluation processes (prefrontal cortex) versus those areas implicated in negative emotions like disgust (amygdala).

Agent-based modeling can be used to explore how firms, markets, and industries evolve under accounting systems of differing effectiveness in guiding exchange interactions. These methods have been used in a limited way within the accounting literature (Davis et al. 2003; Dickhaut and Xin 2007). Agent-based modeling allows a researcher to directly examine conditions where some firms within an industry have access to superior information technologies while others do not. That is, such methods may allow for identification of how accounting could be a major influence on firm survival and profitability.[7]

As for policy, an exchange guidance demand for accounting is applicable to the joint efforts of FASB and IASB to reformulate the conceptual framework of accounting to a balance sheet focus with fair values motivated entirely on the valuation demand for accounting information by "users" of accounting information.[8] These efforts, if successful, will minimize the stewardship demand for accounting by eradicating Conservatism in favor of Neutrality (Gore and Zimmerman 2007). They will also render the Matching Concept a dead letter within accounting practice, lessen Objectivity by allowing balance sheet account revaluations based on hypothetical (i.e., non-consummated) transactions, and have the paradoxical effect of undermining the usefulness of accounting income, which is the metric actually used most often for valuation purposes. These are not pure conjectures; recent evidence suggests that accounting income has become less useful for valuation as a result of erosion of expense matching during FASB's tenure (Dichev and Tang 2008).[9] While accounting researchers do not set policy, they can provide socially valuable research that helps us to understand the economic foundations of accounting. The two studies I comment on in this article (Allee and Yohn 2009; Cassar 2009) are exemplars because they provide fresh insights on the fundamental demand for accounting.

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[6] Chandler (1977) provides numerous examples intended to illustrate how cost accounting techniques were a key component of a "visible hand" that promoted the development of the modern corporation.

[7] Biological investigations of financial decision making and the use of agent-based models have recently entered the finance literature—see Lo and Repin (2002) and Chan et al. (1999).

[8] I have placed the term "users" in quotes because these efforts are not derived from interactions with those who actually read and act upon accounting data. Young (2006) argues instead a prototype of users has been self-constructed within the standard-setting process.

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[9] Nissim and Penman (2008) provide an intelligent and thorough analysis of the conceptual and pragmatic weaknesses of FASB's emphasis on fair valued balance sheets.

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Earnings Management Strategies and the Trade-Off between Tax Benefits and Detection Risk: To Conform or Not to Conform?

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ABSTRACT: Prior research has separately examined pretax earnings management activities that have current taxable income consequences (book-tax "conforming earnings management") and those that do not have current taxable income consequences (book-tax "nonconforming earnings management"). Our study documents the prevalence of, and then investigates the firm-specific characteristics that impact the choice between, these earnings management strategies. We utilize a sample of firms that restated their earnings downward due to accounting irregularities and thus can be presumed to have managed earnings upward. We find that nonconforming earnings management is more prevalent and that firms trade off the net present value of tax

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benefits against the net expected detection costs associated with nonconforming earnings management. In particular, firms having NOL carryforwards, using a high-quality auditor, or engaging in the most egregious misstatements rely less on nonconforming earnings management strategies. We also find that book-tax differences are useful in predicting restatements.

Keywords: *earnings management; earnings restatements; book-tax differences; deferred tax expense; current tax expense.*

Data Availability: *All data used in this research are from publicly available sources.*

I. INTRODUCTION

This study examines tax and nontax implications of pretax earnings management. A number of studies, e.g., Scholes et al. (1990), Matsunaga et al. (1992), Dhaliwal et al. (1994), and Erickson et al. (2004), investigate accounting choices and earnings management activities that have current taxable income consequences, which we refer to as book-tax *conforming* earnings management. Other studies, including Mills and Newberry (2001), Joos et al. (2003), and Phillips et al. (2003, 2004), consider earnings management that does not affect current taxable income (i.e., *nonconforming* earnings management). Utilizing a sample of firms that restated earnings due to accounting irregularities, we extend these prior studies in two ways. First, we document the prevalence of book-tax conforming and nonconforming earnings management in our sample of firms that restated their financial results (hereinafter, misstatement firms). Second, and more importantly, we investigate which firm-specific characteristics impact the choice between conforming and nonconforming earnings management strategies.[1]

This research is important because it provides a better understanding of the choices firms make when managing earnings. By examining firms known to have misstated their reported earnings, we are able to estimate the relative prevalence of alternative earnings management strategies. Specifically, we examine the trade-offs managers face between the tax costs associated with pretax earnings management and the risks of being exposed as an earnings manager, and thus present evidence concerning the sensitivity of firms' earnings management choices to factors reflecting greater or lesser tax benefits and greater or lesser detection costs. Moreover, our research responds to Healy and Wahlen's (1999, 379) call for a better "understanding of the steps that firms take to increase reported earnings."

Our sample firms' misstatements reflect accounting irregularities and thus provide an interesting context in which to study earnings management (e.g., Richardson et al. 2002; Palmrose et al. 2004; Collins and Wan 2005; Badertscher et al. 2007; Hennes et al. 2007). We utilize the restatement setting to identify book-tax conforming and nonconforming earnings management because each choice has unique, predictable effects on the originally reported and restated current tax accounts. Consistent with Erickson et al. (2004), income-increasing conforming earnings management results in a downward restatement of pretax income and current tax expense. In contrast, income-increasing *nonconforming* earnings management results in a downward restatement of pretax income but not current tax expense.[2] Hence, restatements of current tax expense reveal the type of pretax earnings management (i.e., book-tax conforming or nonconforming) that managers employed.

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[1] We are concerned with pretax earnings management (i.e., managing revenue and expense accounts that affect pretax income) and how it is reflected in income tax accounts. Dhaliwal et al. (2004), Krull (2004), and Frank and Rego (2006) focus on managing the income tax accrual, which only affects after-tax earnings.

In our preliminary analysis, we document that nonconforming earnings management accounts for the overwhelming proportion of misstatement firms' total pretax earnings management. Our primary analysis then investigates the trade-offs firms make between the tax benefits of nonconforming earnings management and the higher expected detection costs associated with such strategies.[3] This framework builds on results in Mills (1998), Mills and Sansing (2000), and Hanlon and Krishnan (2005), which suggest that large book-tax differences trigger increased scrutiny by regulators and external auditors. We hypothesize that the lower the net present value of tax benefits or the higher the net expected detection costs associated with nonconforming earnings management, the less firms will rely on nonconforming strategies.

More specifically, we identify firm-specific characteristics that should impact the net present value of tax benefits or the net expected detection costs associated with nonconforming earnings management. First, we predict that firms with net operating loss (NOL) carryforwards have a lower net present value of tax benefits associated with nonconforming earnings management, and that firms with high free cash flow place a lower value on the tax benefits associated with nonconforming earnings management. Hence, we expect such firms to engage in more conforming earnings management. Second, we predict firms that use high-quality external auditors, have greater analyst following, or engage in accounting fraud have higher expected detection costs associated with nonconforming earnings management and thus engage in more conforming earnings management.

Because we expect that using nonconforming earnings management strategies increases the chances of being detected as an earnings manager, we use the Heckman (1979) two-step estimation approach to help correct for potential self-selection bias in our misstatement sample. We first develop and estimate a prediction model for restatements, and then in the second step we estimate an earnings management strategy choice model after including the self-selection adjustment (the inverse Mills ratio) extracted from the first step. The results of the second-stage estimation are our main results and indicate, as predicted, that firms with lower tax costs, proxied by firms with NOL carryforwards, and firms with higher expected net detection costs, as proxied by firms that have a Big 4/5/6 auditor or that engage in the most egregious misstatements (e.g., accounting fraud), rely on significantly less nonconforming earnings management. In addition, we find evidence that firms with large cumulative temporary book-tax differences rely more on conforming earnings management, suggesting that nonconforming earnings management in prior years constrains such firms in their use of nonconforming earnings management in the current period. Further, in contrast to conventional wisdom that revenue recognition is typically book-tax conforming, we find that firms that only manage revenue generally did so in a nonconforming manner by managing unearned revenue. Finally, a new result from the first-step of our Heckman estimation approach is that total book-tax differences have incremental explanatory power beyond abnormal accruals in predicting restatements.

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[2] If the nonconforming earnings management generates a temporary book-tax difference, then the firm, consistent with Phillips et al. (2003), would restate deferred tax expense downward. If the nonconforming earnings management generates a permanent book-tax difference, then the firm would restate pretax income, but not current or deferred tax expense. Because we are interested in earnings management strategies that increase book income without affecting taxable income, we define nonconforming earnings management to include transactions that generate temporary *or* permanent book-tax differences. Nonetheless, supplemental analyses show that inferences from our empirical tests do not change if we focus on nonconforming earnings management that generates only temporary book-tax differences.

[3] The "tax benefits of nonconforming earnings management" are equivalent to the tax costs of conforming earnings management. While conforming earnings management accelerates taxes relative to nonconforming earnings management, we generally refer to the "tax benefits of nonconforming earnings management" since we frame the manager's choice as trading off the costs and benefits of nonconforming strategies.

Our research contributes to a better understanding of the tax and nontax factors that managers trade off when managing earnings upward. Erickson et al. (2004) document that some firms paid taxes in conjunction with income-increasing fraudulent earnings management. We extend their work by considering detection costs as well as the tax consequences of pretax earnings management and identify circumstances in which managers are likely to engage in more book-tax conforming earnings management. We also contribute to research that seeks to predict accounting irregularities, including fraudulent reporting (Richardson et al. 2002; Dechow et al. 2007), by demonstrating that total book-tax differences, and its major component, temporary differences, are incrementally useful in predicting restatements.

Our paper proceeds as follows. Section II develops our predictions and Section III discusses the research design. We describe our sample in Section IV and present the empirical results in Section V. Section VI concludes.

II. PRIOR RESEARCH AND PREDICTIONS

Background

We utilize data from financial statements and accompanying income tax footnotes to investigate the extent to which pretax earnings management affects current taxable income. Our study builds upon several streams of research, including studies that investigate earnings management accomplished via book-tax conforming and nonconforming strategies and studies that consider earnings restatements as evidence of earnings management activity.

One stream of research that we build upon focuses on book-tax conforming upward earnings management, which increases both financial (i.e., book) and taxable incomes and thus has current income tax consequences (e.g., Scholes et al. 1990; Matsunaga et al. 1992; Dhaliwal et al. 1994; Erickson et al. 2004). Conforming earnings management includes any transaction that has the same impact on the current period's book and taxable incomes.[4] Common examples of conforming earnings management include accelerating revenue recognition and recording receivables sooner than justified (e.g., revenue front-loading and channel-stuffing) and altering the timing of inventory purchases under LIFO.[5] An example of a firm from our sample that primarily engaged in conforming earnings management is Versatility Inc., which determined that certain revenue had been inappropriately accelerated, the related receivables had been improperly recorded, and certain costs had not been accrued. We estimate that approximately 73 percent of Versatility's earnings management was conforming (see Appendix C).

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[4] Erickson et al. (2004) document that 15 of 27 firms that fraudulently overstated their financial accounting income paid, on average, 20 cents of current income tax for every dollar of overstated pretax income. Their results are consistent with some firms being willing to incur the tax costs associated with upward conforming earnings management to avoid the financial reporting costs of reporting lower earnings or to reduce the likelihood (*ex ante*) of detection. Our focus is not on cash taxes paid but instead considers how income tax accounts disclosed in firms' financial reports can be used to determine how firms manage their earnings.

[5] Making purchases in the current year when input prices have fallen or postponing purchases at year-end when input prices have risen are examples of how earnings can be managed using LIFO.

In contrast, other studies focus on nonconforming upward earnings management, which increases book income but has no current tax consequences (e.g., Mills and Newberry 2001; Joos et al. 2003; Phillips et al. 2003; Phillips et al. 2004; also textbooks such as Revsine et al. 2005; Palepu et al. 2003). This type of earnings management includes transactions that accelerate revenue recognition or defer expense recognition for financial reporting purposes, relative to tax purposes, such as aggressively recognizing unearned revenue, extending the useful lives of depreciable assets, or reducing the provision for doubtful accounts for financial reporting purposes. These transactions, which have no effect on current taxable income, lead to more positive (or less negative) book-tax differences. An example of a firm from our sample that primarily engaged in nonconforming earnings management is Pre-Paid Legal Services Inc., which announced it had overstated revenue and understated expenses. We determine that approximately 97 percent of Pre-Paid Legal Services' earnings management was book-tax nonconforming (see Appendix C).[6] Note in the above examples that both firms' misstatements involve several accounts and reflect a mix of book-tax conforming and nonconforming earnings management, suggesting that those firms had a portfolio of earnings management strategies available to them.

Mills and Newberry (2001) access confidential tax return data and use the total difference between a firm's book and taxable incomes as their proxy for nonconforming earnings management activity. Most book-tax difference studies, however, rely on publicly available data and use deferred tax expense or the change in net deferred tax liabilities as proxies for nonconforming earnings management activity.[7] Since book-tax differences can reflect earnings management, tax planning, nondiscretionary book-tax rule differences, or other information about firms' economic activities (e.g., Hanlon et al. 2009; Dhaliwal et al. 2008), prior book-tax difference studies likely measure nonconforming earnings management activity with error.[8] Moreover, identifying settings in which earnings management is likely to have occurred is also problematic. For example, studies that focus on firms that just meet or beat earnings benchmarks (e.g., Burgstahler and Dichev 1997; Phillips et al. 2003; Durtschi and Easton 2005), or on firms with relatively high levels of debt (e.g., DeAngelo et al. 1994; DeFond and Jiambalvo 1994; Becker et al. 1998), not only rely on earnings management metrics that contain measurement error, but also lack certainty as to which firms engaged in earnings management.

We utilize a sample of firms that restated their financial results to correct previously reported accounting irregularities and, thus, we are able to minimize error in identifying earnings management activity. As Badertscher et al. (2007, 20) note, these "accounting irregularities include aggressive accounting practices, material errors, misinterpretation of accounting rules, and intentional or unintentional misuse of facts and fraud." Hence, studies utilizing such firms assume most restatements reflect earnings management (e.g., Richardson et al. 2002; Palmrose et al. 2004; Badertscher et al. 2007). Given uncertainty as to whether and/or to what extent, for example, benchmark beaters (e.g., Durtschi and

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[6] This example is consistent with prior research that proposes, other things equal, firms should prefer to manage earnings upward in a manner that boosts book income relative to taxable income, thereby minimizing current tax effects (e.g., Phillips et al. 2003).

[7] Under Statement of Financial Accounting Standard No. 109, deferred tax expense reflects temporary differences between book and taxable incomes. See Phillips et al. (2003) for a more detailed discussion of SFAS No. 109.

[8] Likewise, studies that use abnormal accruals to measure earnings management also do so with error (e.g., Guay et al. 1996).

Easton 2005) or firms with high debt levels manage earnings, restatements are a more reliable indicator of earnings management activity.[9]

Focusing on misstatement firms also enables us to use each firm as its own control and more accurately measure the amount of pretax earnings management (e.g., Erickson et al. 2004). The misstatement sample provides measures of managed financial results (i.e., originally reported earnings and its components) and unmanaged financial results (i.e., restated earnings and its components) for each misstatement firm. We hand-collect such data, which enables us to measure total pretax earnings management as the difference between restated and original pretax income.[10] Moreover, the misstatement setting is also attractive because it is difficult, if not impossible, to control for the amount of tax planning that firms engage in. By comparing originally reported and restated data for the same firm and year, we are able to hold constant the effects of a firm's tax planning on current and deferred income tax expense. For instance, we can interpret changes in current tax expense resulting from restatements as being related to conforming earnings management activity and unrelated to tax-planning activity. Similarly, we are also able to hold constant the effects of other items that impact the tax accounts (e.g., tax credits and tax benefits from stock option exercises) but that are not affected by the restatement. In sum, restatements allow us to more accurately identify a setting in which earnings management is very likely to have occurred, to better measure the total amount of managed earnings, and to more reliably classify the earnings management strategies (i.e., conforming or nonconforming) relative to prior earnings management research.

Predictions

Previous research documents conforming upward earnings management in certain contexts (e.g., LIFO abandonments [Johnson and Dhaliwal 1988] and fraudulent earnings overstatements [Erickson et al. 2004][11]), and nonconforming upward earnings management in other contexts (e.g., earnings benchmarks [Mills and Newberry 2001] and [Phillips et al. 2003]). Hence, prior research has considered conforming and nonconforming earnings management separately, i.e., in different settings in which one strategy or the other was more likely to be used. We analyze a setting where, because there is a high probability that earnings management occurred, we can examine the extent to which firms opted to use conforming or nonconforming methods. Thus, we initially investigate whether our sample of misstatement firms engaged in more nonconforming than conforming upward earnings management.

Our main focus, however, is to directly investigate the trade-off between the tax benefits and the higher risk of detection associated with nonconforming earnings management. We do so by considering conditioning circumstances in which, other things equal, we expect that firms are more likely to choose to manage earnings upward in a book-tax *conforming* manner. We assume firms have sufficient opportunities to engage in both conforming and

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[9] Although we analyze earnings management strategies for a sample of firms likely to have managed earnings, we cannot claim with certainty that all of the earnings management was intentional. An even more extreme sample would be that of firms known to have committed accounting fraud. While there is no uncertainty in such a sample about the occurrence of egregious earnings management, such a sample would be smaller than our sample of misstatement firms. We test fraud firms versus non-fraud firms, and thus provide insight as to whether our results are restricted to fraud firms or generalize to the larger set of misstatement firms.

[10] Restated financial results can presumably still reflect unacknowledged earnings management; nonetheless, we assume that restated amounts reflect strictly less earnings management than the amounts firms originally reported.

[11] Erickson et al. (2004) note that many firms in their sample deferred some taxes on earnings overstatements.

nonconforming earnings management,[12] and propose that firms manage earnings in a no
conforming manner when the net present value of tax benefits ($Net\ PVTB_{NC}$) exceeds th
net expected detection costs associated with nonconforming earnings management (N
$E[DC]_{NC}$); i.e., when:

$$Net\ PVTB_{NC} > Net\ E[DC]_{NC}. \qquad ($$

We define the net present value of tax benefits from nonconforming earnings manag
ment as the present value of the tax costs related to book-tax conforming earnings ma
agement ($PVTC_C$) minus the present value of the tax costs related to *non*conforming ear
ings management ($PVTC_{NC}$). We define net expected detection costs as the expecte
detection costs related to *non*conforming earnings management ($E[DC_{NC}]$) minus the e
pected detection costs related to conforming earnings management ($E[DC_C]$). Accordingl
firms will engage in *non*conforming earnings management when:

$$PVTC_C - PVTC_{NC} > E[DC_{NC}] - E[DC_C]. \qquad ($$

We define the present value of tax costs as the amount of pretax earnings manageme
(PT_EM) times the statutory tax rate (STR), and in the case of nonconforming earnin
management this amount is discounted by a factor that increases in both the discount ra
(r) and the number of years (n) it would take the nonconforming earnings management
reverse ($(1 + r)^n$).[13] Appendix A shows that the net present value of tax benefits associat
with nonconforming earnings management ($Net\ PVTB_{NC}$) is increasing in PT_EM, STR,
and n.

We define expected detection costs ($E[DC]$) as the probability of detection ($Pr(D_{NC})$
$Pr(D_C)$) multiplied by total detection costs (DC). Examples of the possible costs of bei
detected as an earnings manager include Securities and Exchange Commission investig
tions and Internal Revenue Service audits, the related costs of appeals and penalties r
sulting from such investigations and audits, and negative share price effects and high
costs of capital associated with restatements.

Thus, considering the tax benefits and detection costs of both types of earnings ma
agement strategies, firms will engage in nonconforming earnings management when:

$$\begin{aligned}&\{PT\_EM \times STR - [(PT\_EM \times STR)/(1 + r)^n]\}\\ &\quad > \{[Pr(D_{NC}) \times DC] - [Pr(D_C) \times DC]\}. \qquad (\end{aligned}$$

Rearranging terms leads to the following expression:

$$PT\_EM \times STR\ \{1 - [1/(1 + r)^n]\} > [Pr(D_{NC}) - Pr(D_C)] \times DC \qquad ($$

where we assume that total detection costs (DC) do not vary with the type of earnin
management strategy, and that $[Pr(D_{NC}) - Pr(D_C)] > 0$. This last assumption, that t

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[12] In our empirical analysis, we control for a firm's earnings management opportunity set, including its opportuniti
to employ conforming and nonconforming methods. If firms do not have both conforming and nonconformi
methods available to manage earnings, then our multivariate analysis of the trade-offs of tax benefits and d
tection costs will not yield significant results for the tax benefit and detection cost variables.

[13] We do not have to assume that all nonconforming earning management reverses. To incorporate non-reversi
accruals, we assume that $n \rightarrow \infty$, which could also represent permanently nonconforming earnings manageme

probability of detection is greater for nonconforming than conforming earnings management, is based on prior research that argues book-tax differences often attract the attention of regulators such as the IRS (Mills 1998; Mills and Sansing 2000) and the SEC (Frank et al. 2009). Further, Hanlon and Krishnan (2005) find that external auditors increase the time and effort they spend on clients that have larger book-tax differences. These studies suggest that nonconforming relative to conforming earnings management should lead to a higher probability of detection and, in turn, higher net expected detection costs.

Equations (1)–(4) motivate two hypotheses; the first hypothesis focuses on the net present value of tax benefits associated with nonconforming earnings management (H1), and the second focuses on the net expected detection costs associated with nonconforming earnings management (H2). These hypotheses are (stated in the alternative):

H1: Other things equal, the lower the net present value of tax benefits associated with nonconforming earnings management, the lower the rate of nonconforming earnings management.

H2: Other things equal, the greater the net expected detection costs associated with nonconforming earnings management, the lower the rate of nonconforming earnings management.

We develop proxies for the net present value of tax benefits and net expected detection costs associated with nonconforming earnings management in the next section.

III. RESEARCH DESIGN

Prevalence of Conforming and Nonconforming Earnings Management

We use the difference between originally reported and restated current tax expense disclosed in earnings restatements to measure the amount of book-tax conforming earnings management (e.g., Erickson et al. 2004). An advantage of this research design is that it avoids much of the measurement error inherent in using current tax expense to estimate taxable income (e.g., Hanlon 2003) because we are using each firm as its own control. That is, isolating restatement-induced *changes* in current tax expense holds the effect of tax credits and other such items constant, thus enabling us to measure the resulting *changes* in current taxable income attributable to conforming earnings management with less error than is typically associated with measuring taxable income using financial statement data. However, NOL carryforwards add measurement error to this proxy for conforming earnings management. In particular, if firms that manage earnings upward in a book-tax conforming manner have NOL carryforwards to offset the increase in taxable income, then originally reported and restated current tax expense will measure conforming earnings management with error.[14] In addition, multinational corporations can manage U.S. and/or foreign pretax income. Thus, changes in current tax expense can be attributable to differences between originally reported and restated U.S. and/or foreign earnings. To address these issues, we use hand-collected financial report data to compute the amount of conforming earnings management as follows:

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[14] Appendix B illustrates NOL-induced measurement error.

$$CONFORM\_EM = \frac{(\Delta FED\_CTE - \Delta FEDNOL\_DTA)}{FED\_RATE} + \frac{(\Delta FOR\_CTE - \Delta FORNOL\_DTA)}{FOR\_RATE}$$

(5

where the amount of conforming earnings management, *CONFORM_EM*, is based on cur rent federal and foreign tax expense adjusted for changes in a firm's deferred tax asset resulting from NOL carryforwards. We gross-up the adjusted changes in federal and fo eign current tax expense (i.e., ($\Delta FED\_CTE - \Delta FEDNOL\_DTA$) and ($\Delta FOR\_CT$ $- \Delta FORNOL\_DTA$)) by, respectively, the federal statutory tax rate (*FED_RATE*) and th estimated foreign tax rate (*FOR_RATE*), so that *CONFORM_EM* is an estimate of the tot dollar amount of conforming earnings management.[15]

We scale *CONFORM_EM* by the total amount of pretax earnings management (i.e *PT_EM*) to compute the proportion (or rate) of total earnings management that was book tax conforming (*C_RATE*).[16] We then compute the proportion of total earnings managemen that was book-tax *non*conforming (*NC_RATE*) as 1 minus *C_RATE*.[17] Appendix C illus trates the calculation of *C_RATE* and *NC_RATE* for two firms in our sample: one that use predominantly conforming methods and one that uses predominantly nonconforming meth ods. In our preliminary analysis, we compare sample means and medians to determin whether *NC_RATE* is significantly greater than *C_RATE*.

The Choice between Conforming and Nonconforming Earnings Management

To investigate which firm-specific characteristics impact the trade-off between the ta benefits and expected detection costs associated with nonconforming earnings managemen (i.e., to test H1 and H2), we estimate the following regression using our sample of mis statement firms:

$$\begin{aligned} NC\_RATE_i = {} & \alpha_0 + \alpha_1 NOL_i + \alpha_2 HI\_CASH_i + \alpha_3 BIG\_AUDIT_i + \alpha_4 AF_i \\ & + \alpha_5 FRAUD_i + \alpha_6 MTB_i + \alpha_7 REV\_ONLY_i + \alpha_8 EXP\_ONLY_i \\ & + \alpha_9 LAG\_TA_i + \alpha_{10} MNC_i + \alpha_{11} BLOAT_i + \alpha_{12} LAG\_NDTL_i \\ & + \alpha_{13} SC\_PT\_EM_i + \alpha_{14} INV\_MILLS_i + \alpha_j \Sigma_j INDUS_i + \varepsilon_i \end{aligned}$$

(6

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[15] We found that firms disclosed deferred tax assets related to NOL carryforwards more frequently than the doll amounts of NOL carryforwards; thus, we utilize the total amount of deferred tax assets related to NOL carr forwards to adjust current tax expense. We allocate the total amount of deferred tax assets related to NO carryforwards (ΔNOL_DTA) between the U.S. and foreign tax jurisdictions by multiplying ΔNOL_DTA by th ratios of U.S. or foreign pretax incomes to total pretax income, respectively. Also, because firms often operat in multiple foreign jurisdictions, we estimate the foreign tax rate that applies to any restated foreign earnings a the change in foreign current tax expense (ΔFOR_CTE), scaled by the amount of restated foreign earning (*FORPT_EM*). See Appendix D for complete variable definitions.

[16] Although utilizing restatements of current tax expense to measure changes in taxable income mitigates much o the measurement error inherent in measuring taxable income, measurement error attributable to state and foreig taxes still exists.

[17] Prior research has used deferred tax expense as a proxy for nonconforming earnings management (e.g., Philli et al. 2003; Hanlon 2005). Deferred tax expense reflects earnings management that causes temporary book-ta differences, and thus excludes the possibility of earnings management that generates permanent book-tax di ferences. The valuation allowance account (VAA) induces additional measurement error when using deferre tax expense to estimate nonconforming earnings management since changes in the VAA may be attributable t federal, foreign, or state tax jurisdictions, but firms disclose such jurisdictional information infrequently. None theless, in supplemental analyses we compute a temporary nonconforming earnings management rate based o deferred tax expense. Inferences from empirical tests based on this alternate definition of nonconforming earning management are substantially the same as those based on *NC_RATE* equals 1 − *C_RATE*.

where year t is the year for which firm i restates its financial statements. If firm i restates multiple years' financial statements, then year t is the first misstatement year. (See Appendix D for complete variable definitions.)

NC_RATE, the dependent variable in Equation (6), is the proportion (or rate) of nonconforming earnings management. We focus on the proportion rather than the total amount of nonconforming earnings management because our hypotheses focus on the rate of nonconforming earnings management, i.e., the amount of firm i's nonconforming earnings management *relative* to its total earnings management.

To test H1 and H2, we include proxies for the net present value of tax benefits and the net expected detection costs associated with nonconforming earnings management. The first proxy for the net tax benefits is the availability of NOL carryforwards (*NOL*), which would absorb at least part of the impact of upward conforming earnings management and thereby reduce the tax benefits associated with *non*conforming earnings management. All else equal, we expect misstatement firms with NOLs available at the beginning of the misstatement year to engage in less nonconforming upward earnings management than firms without such carryforwards.

Our second proxy for the net tax benefits of nonconforming earnings management is based on firms' free cash flow. All else equal, firms with relatively high free cash flow have a greater ability to pay the additional taxes caused by conforming upward earnings management; this suggests they would apply lower discount rates and thus derive lower tax benefits from nonconforming earnings management than firms with relatively low levels of free cash flow. We define *HI_CASH* as an indicator variable equal to 1 if the firm is in the top one-third of the free cash flow distribution for all misstatement firms and predict that firms with *HI_CASH* equal to 1 engage in less nonconforming earnings management.[18]

We identify three proxies for the net expected detection costs associated with nonconforming earnings management. We assume that greater monitoring increases the probability of detection associated with nonconforming *vis-à-vis* conforming earnings management, and predict that misstatement firms subject to more effective monitoring are more likely to manage earnings in a conforming manner to minimize the risk of detection. Consistent with Francis and Wilson (1988) and Hanlon and Krishnan (2005), we assume that high-quality auditors are more effective monitors and thus utilize the information in large book-tax differences more effectively than low-quality auditors. Hence, we predict that all else equal, firms with high-quality external auditors are less likely to manage earnings in a nonconforming manner. We define *BIG_AUDIT* as an indicator variable equal to 1 if the firm used a Big 4/5/6 auditor during the misstatement year. Similarly, greater analyst following (*AF*) should provide more effective monitoring (relative to less analyst following). Thus, we predict that all else equal, firms with greater analyst following are also less likely to engage in nonconforming earnings management. *AF* equals 1 (0) if a firm has any (no) analyst following.[19]

Our third proxy for expected detection costs recognizes that the potential costs associated with fraudulent earnings management are undoubtedly very large, and we thus expect that firms engaging in fraud have strong incentives to avoid detection.[20] Moreover, we find in untabulated results that the termination of a top executive officer often accompanies the most egregious misstatements, which includes cases of fraudulent reporting. Consequently, we predict firms that commit accounting fraud and/or replace top executive officers in connection with earnings misstatements are more likely to have managed earnings in a book-tax conforming manner to minimize net expected detection costs. We label this detection cost variable *FRAUD* and define it as an indicator variable equal to 1 if a misstatement firm *ex post* was alleged to have engaged in egregious earnings management, which we proxy for by the presence of allegations of accounting fraud and/or the replacement of the firm's CEO, CFO, or President around the restatement date. To identify such firms, we use Lexis-Nexis and 10kwizard.com to conduct a keyword search for variants of "fraud" or "fictitious," "CEO," "CFO," or "President," and "firing," "dismissal," "removal," "step down," or "termination" in all misstatement firms' press releases and financial statements.[21]

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[18] We obtain similar results when we use a 75 percent cutoff to determine when *HI_CASH* is equal to 1.

[19] Results are similar when we set *AF* equal to the number of analysts following a firm. In untabulated results we also include institutional investors as a proxy for more effective monitoring. The results are similar to those tabulated in this paper, but the institutional investor variable is not significant, perhaps due to a reduced sample size.

Consistent with H1 and H2, we expect the coefficients on our proxies for the net tax benefits and the higher expected detection costs associated with nonconforming earnings management, i.e., $\alpha_1 - \alpha_5$ in Equation (6), to be negative, indicative of less nonconforming earnings management.

Equation (6) also includes control variables. First, because growth firms often report losses, it is possible that our NOL variable proxies for growth rather than the availability of tax benefit carryforwards. To address this issue, we include the market-to-book (*MTB*) ratio to control for the effect of growth opportunities. Second, there are likely different costs and benefits associated with managing different accounts to increase income and, thus, we include additional indicator variables for misstatements that involve only revenue recognition irregularities (*REV_ONLY*) or only expense recognition irregularities (*EXP_ONLY*).

Third, we include controls for a firm's opportunities to manage earnings in conforming and nonconforming ways (i.e., for its earnings management opportunity set) as follows. *LAG_TA* and *MNC* control, respectively, for firm size and the firm's status as a multinational corporation. Larger firms and multinational firms presumably have different and greater opportunities to manage earnings.[22,23] *BLOAT* and *LAG_NDTL* capture the extent to which firms are constrained in their ability to manage earnings based on prior activity. *BLOAT* proxies for prior accrual manipulation (Barton and Simko 2002) and reflects the extent that a firm's balance sheet is already "bloated" with accruals, while *LAG_NDTL* captures the extent that a firm's balance sheet already contains higher deferred tax liabilities related to prior nonconforming earnings management (Phillips et al. 2004).[24] *SC_PT_EM* controls for the relative magnitude of the earnings management. The greater the amount of total earnings management scaled by total assets, the more likely managers will exhaust the desired earnings management method (e.g., nonconforming) available to them and thus employ more of the less desired method (e.g., conforming). Finally, we include *INDUS* to control for fundamental differences that may exist in earnings management opportunities across different industries.

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[20] The excess costs of fraudulent earnings management include potentially higher legal and regulatory costs (e.g., attorney and court costs, and fines paid to regulatory agencies), shareholder wealth costs (due to the stock market's loss of confidence in the financial and/or tax reporting of the firm), and management turnover costs (due to terminating existing management and locating new, talented individuals).

[21] Note that our fraud variable is based on allegations of fraud rather than legal outcomes, since the latter almost certainly would not occur until several years following the misstatement. Moreover, if fraud is suspected but is expected to be difficult or costly to prove, a firm (or prosecutor) might decide to not pursue a fraud case. Nonetheless, the firm would be more likely to replace any executives involved.

[22] Firm size can proxy for political costs (Watts and Zimmerman 1986). Large firms may engage in more conforming upward earnings management and thus incur higher current taxes and report higher current effective tax rates to avoid additional regulatory scrutiny (e.g., Zimmerman 1983), or they may be less inclined to manage earnings upward (Watts and Zimmerman 1996).

[23] The U.S. does not tax foreign source income until it is repatriated to the U.S. but the same income is recognized on firms' consolidated financial statements. Multinational corporations can thus manage earnings in foreign countries to boost their book income but avoid any current U.S. tax consequences. In addition, *MNC* controls for the greater opportunities multinational firms have to manage taxable income (Rego 2003), which could increase temporary or permanent book-tax differences for reasons other than earnings management in shareholder reports.

Self-Selection Correction

Investigating the choice between conforming versus nonconforming earnings management among misstatement firms is problematic because the misstatement firms were likely "caught with their hands in the cookie jar" by the SEC, their external auditor, or a corporate insider. To the extent the probability of detection is greater when a firm engages in nonconforming earnings management, the misstatement sample may reflect a self-selection bias toward nonconforming earnings management. Accordingly, we control for self-selection using Heckman's (1979) two-step estimation approach.[25]

More specifically, we first estimate a selection model to predict restatements, Equation (7) below, using misstatement firms and a control sample of non-misstatement firms. The dependent variable in the selection model is *RESTATE*, which equals 1 if a firm restates earnings, and 0 otherwise. We estimate Equation (7) and extract the self-selection adjustment, which is referred to as the inverse Mills ratio (*INV_MILLS*), and then include it in Equation (6), which is the second step of the estimation procedure.[26] Assuming that self-selection bias is significant in our sample, we expect *NC_RATE* to be positively related to the inverse Mills ratio; i.e., *INV_MILLS* should be an increasing function of the probability that a firm is detected managing earnings due to nonconforming methods and thus is required to restate its earnings.

The selection model we estimate is as follows:

$$\begin{aligned} RESTATE_i = {} & \beta_0 + \beta_1 BT\_DIFF_i - \beta_2 MJAC_i + \beta_3 MBE_i + \beta_4 MTB_i \\ & + \beta_5 FIN\_R_i + \beta_6 LEV_i + \beta_7 INV\_INTCOV_i + \beta_8 EPS\_G_i \\ & + \beta_9 STRING_i + \beta_{10} CFO_i + \beta_{11} \Delta CFO_i + \beta_{12} BIG\_AUDIT_i \\ & + \beta_{13} AF_i + \beta_{14} MNC_i + \beta_{15} LAG\_TA_i + \beta_{16} \Delta AR_i + \beta_{17} \Delta INV_i \\ & + \beta_{18} \Delta CASHSALES_i + \beta_{19} \Delta EARN_i + \beta_{20} ABN\Delta EMPLOYEES_i \\ & + \beta_{21} OP\_LEASES_i + \beta_j \Sigma_j INDUS_i + \varepsilon_i. \end{aligned} \tag{7}$$

See Appendix D for complete variable definitions.

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[24] We include *LAG_NDTL* as the book-tax "bloat" control variable because permanent differences are not recognized in the financial statements and thus we can only control for the extent of prior *temporary* nonconforming earnings.

[25] Unlike, for example, the choice of LIFO or FIFO (Maddala 1991), when a firm decides whether to manage earnings, it is not directly choosing to restate or not restate earnings. Rather, the firm in effect decides whether to take on the additional risk that its earnings management will be detected, which may then result in a restatement. Hence, self-selection bias in our setting may not be a first-order effect.

[26] *INV_MILLS* equals the probability density function of the standard normal divided by the cumulative density function (e.g., Kennedy 1998) extracted from the estimation of Equation (7). We thank Shivaram Rajgopal for programming assistance in estimating *INV_MILLS*.

Our restatement prediction model builds on prior restatement research by Richardson et al. (2002), on recent fraud research by Dechow et al. (2007), and on our previous discussion concerning the probability of detection associated with nonconforming earnings management. The explanatory variables in Equation (7) represent the following factors: (1) current period earnings management activity, as captured by modified Jones-model abnormal accruals, *MJAC* (Dechow et al. 1995) and current period book-tax differences, *BT_DIFF* (e.g., Phillips et al. 2003; Hanlon 2005); (2) incentives, or lack thereof, to manage earnings upward, proxied by security issuances (*FIN_R*), closeness to debt covenants (*LEV* and *INV_INTCOV*), meeting current earnings targets (*MBE*), a history of meeting or beating analyst forecasts (*STRING*) and prior years' earnings targets (*EPS_G*), growth firms (*MTB*), and current operating performance (Δ*CFO* and *CFO*); (3) proxies for the probability of detection, *BIG_AUDIT* and *AF*; (4) additional control variables that Dechow et al. (2007) find significant in predicting fraud (beyond the variables we have already included) and for which we have the data, including additional performance variables (Δ*CASHSALES* and Δ*EARN*) and accrual quality variables (Δ*AR* and Δ*INV*), and variables reflecting nonfinancial (i.e., abnormal change in employees, *ABN*Δ*EMPLOYEES*) and off-balance sheet (i.e., existence of operating leases, *OP_LEASES*) factors; and (5) other possible predictors of earnings misstatements, including firm size (*LAG_TA*), multinational activity (*MNC*), and industry membership (*INDUS*).[27]

IV. SAMPLE

We identify misstatement firms (i.e., firms that restated their financial statements in a subsequent year) from the October 2002 GAO report. The report includes 845 firms that made 919 public announcements of restatements during the period from January 1, 1997, to June 30, 2002.[28] The restatements corrected previous material misstatements of financial statement numbers caused by accounting irregularities. Such irregularities occur when firms violate GAAP and reflect aggressive accounting practices, material errors, misinterpretation of accounting rules, or the misuse of facts and fraud.

The 845 firms' restatements reflect misstatements of annual or quarterly data. Because we require original and restated annual income tax data, we restrict our analysis to restatements of annual financial statements, which eliminates 407 observations. We hand-collect the following variables from both the originally reported and restated financial reports: total assets, federal and foreign pretax net income, federal and foreign current tax expense, federal and foreign deferred tax expense, current and prior year net deferred tax liabilities, current and prior year deferred tax assets related to net operating losses, current and prior year deferred tax asset valuation allowance amounts, total revenue, income before extraordinary items, net income, and cash flow from operations. We lose 224 firms due to incomplete original or restated balance sheet, income statement, statement of cash flow, and/or income tax footnote data. The full misstatement sample consists of 214 misstatement firms (see Table 1, Panel A).

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[27] According to Woolridge (2003, 585–587), all variables in the outcome equation should be included in the selection model; however, under certain circumstances it is permissible to omit such variables. In our case, we cannot include variables that we hand-collect due to the large number of observations in the non-restatement sample. Nonetheless, we also conducted our analysis by including all outcome equation variables available on Compustat in the selection model, and the results are similar.

[28] The GAO database excludes "restatements resulting from mergers and acquisitions, discontinued operations, stock splits, issuance of stock dividends, currency-related issues, changes in business segment definitions, changes due to transfers of management, changes made for presentation purposes, general accounting changes under generally accepted accounting principles (GAAP), litigation settlements, and arithmetic and general bookkeeping errors" (GAO 2002). Hennes et al. (2007) provide evidence that restatements during our sample period were more likely caused by aggressive accounting practices relative to more recent restatements (i.e., GAO 2006), which are more likely caused by errors.

Panel B of Table 1 describes the composition of the full misstatement sample with regard to the direction of earnings management. Of the 214 misstatement firms, 151 managed earnings upward and we concentrate our analysis on these firms.[29] That is, for the year (or the first year, if a firm has more than one misstatement year) that firms misstated

TABLE 1
Misstatement Sample Selection and Description

Panel A: Misstatement Sample Selection

	n
All GAO (2002) Restatement Announcements	845
Less:	
Exclusion of quarterly restatements	(407)
Exclusion of firms for insufficient financial, tax footnote, and/or restatement data	(224)
Misstatement Sample—Firms	214

Panel B: Misstatement Firms Partitioned by First Year Direction of Earnings Management

Direction of Earnings Management	Firms
First-Year Income Increasing	151
First-Year Income Decreasing	37
No Effect on Pretax Income	26
Total	214

Panel C: Types of Accounting Irregularities Causing the Income-Increasing Misstatements

Reason for Misstatement	GAO Report	Percent of Obs.	Our Sample	Percent of Obs.
Revenue only or revenue and other irregularities	388	36.09%	67	39.88%
Expense only or expense and other irregularities	208	15.70%	33	19.64%
Mergers and Acquisitions	64	5.93%	13	7.74%
In-Process Research and Development	36	3.57%	0	0.00%
Reclassification	48	5.27%	9	5.36%
Related Third Party	31	3.01%	5	2.98%
Restructuring	124	8.94%	16	9.52%
Securities	65	5.36%	10	5.95%
Other	111	14.21%	15	8.93%
Total Firm Irregularities	1,075		168	100.00%
Total Firms	845		151	

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[29] Panel B of Table 1 indicates that 37 firms restated earnings upward. Motivations for downward earnings management appear to differ substantially from upward earnings management, and we leave an analysis of downward earnings managers to future research.

their earnings, the restated pretax earnings are always lower than the amounts originally reported. We analyze the 151 first misstatement years because subsequent years of multi-year restatements likely reflect a mix of upward earnings management and accrual reversals from prior years' earnings management, and focusing on the first year of a multi-year restatement minimizes the impact of such reversals.[30]

In Table 1, Panel C, we summarize the types of accounting irregularities acknowledged by misstatement firms. Because some misstatements reflect multiple accounting irregularities, there are 168 reasons provided by the 151 income-increasing misstatement firms. The most common accounting irregularities in our sample involve (to at least some extent) revenue recognition (40 percent) or expense recognition (20 percent). Per the GAO report, revenue recognition misstatements include instances in which revenue was improperly recognized, questionable revenues were recognized, or that were mistakes or improprieties that led to misreporting revenue.[31] Expense misstatements include instances of improperly recognizing expenses, improperly capitalizing expenditures, or errors in reported expenses.

V. RESULTS

Univariate Analysis

Table 2, Panel A, presents descriptive statistics for our sample of income-increasing misstatement firms for *SC_PT_EM* (i.e., total pretax earnings restatement scaled by lagged total assets), *NC_RATE* and *C_RATE* (i.e., proportions of nonconforming and conforming earnings management, respectively), variables that we predict affect the choice between the two earnings management types, and control variables. The mean (median) amount of *SC_PT_EM* for firms that managed earnings upward is 6.8 (2.5) percent of total assets.[32] The mean (median) *NC_RATE* of 62.9 (95.5) percent of total pretax earnings management is significantly greater than the mean (median) *C_RATE* of 37.1 (4.5) percent.[33] Figure 1 presents a histogram of the distribution of *NC_RATE* (and its complement *C_RATE*). Consistent with the median value of 95.5 percent, the majority of *NC_RATE* observations occur at or near a proportion of 1 (i.e., 100 percent), but the histogram also displays a range of proportions, consistent with firms employing a mix of earnings management methods.[34]

Table 2, Panel A, also indicates that 53.1 percent of sample firms had NOL carryforwards available at the beginning of the misstatement year, the mean and median values of *FREECASH* were negative,[35] 85.3 percent of the sample firms used a Big 4/5/6 auditor, analysts followed 74.1 percent of the firms, and 24 percent of the misstatements reflected

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[30] Untabulated results indicate that approximately 52 percent of misstatement firms restated for only one year, while 36 percent restated two years and 13 percent restated three years. In a sensitivity analysis, we examine firms that *consistently* managed earnings upward, and thus *consistently* restated their earnings downward; i.e., we include firms that restated earnings for multiple years where those restatements decreased pretax income in all years. The results (untabulated) from using this consistently income-increasing earnings management sample indicate that our main inferences remain unchanged.

[31] Our sample contains 9 firms that restated earnings after SEC Staff Accounting Bulletin No. 101, *Revenue Recognition* (SEC 1999), was issued. Our basic inferences are unaffected when these firms are removed.

[32] Amounts of income-increasing earnings management are shown as positive amounts throughout.

[33] In untabulated analysis, we find that the vast majority of *NC_RATE* is attributable to temporary rather than permanent book-tax differences (respective means of 59 versus 4 percent, and medians of 92 versus 2 percent).

[34] The histogram shows that *C_RATE* and *NC_RATE* are sometimes less than 0 or higher than 1. There are at least two reasons why such rates could occur: (1) restatements of accounting irregularities that have partially offsetting current and deferred tax effects, and (2) measurement error associated with our allocation of deferred tax assets related to NOL carryforwards (Δ*NOL*) between the federal and foreign jurisdictions. In the latter case, the measurement error could be caused by state tax complications or because the firm combined its NOL and other tax benefits (e.g., tax credit carryforwards) into a single deferred tax asset number.

[35] Note that by construction, one-third of the misstatement firms had high free cash flows.

TABLE 2
Descriptive Statistics for Income-Increasing Misstatement Firms
(n = 151)

Panel A: Means, Medians, Percentiles, and Standard Deviations

Variable	Mean	Std. Dev.	Percentiles		
			75th	Median	25th
SC_PT_EM	0.068	0.11	0.068	0.025	0.005
NC_RATE	62.86%[a]	0.56	100.00%	95.53%[a]	8.67%
C_RATE	37.14%	0.56	91.35%	4.46%	0.00%
NOL	0.531	0.501	1	1	0
FREECASH	−0.127	0.186	0.027	−0.058	−0.288
HI_CASH	0.333	—	—	—	—
BIG_AUDIT	0.853	0.355	1	1	0
AF	0.741	0.439	1	1	0
FRAUD	0.240	0.406	0	0	0
MTB	4.242	2.997	5.159	3.886	2.048
BLOAT	1.656	0.684	1.465	0.749	0.371
LAG_NDTL	0.059	0.629	0.019	0.003	−0.003
LAG_TA	1,275	2,655	908	115	43
MNC	0.319	0.467	1	0	0

Panel B: Pearson (above diagonal) and Spearman (below diagonal) Correlations (p-values shown below correlations) for Income-Increasing Misstatement Firms

	NC_RATE	*NOL*	*HI_CASH*	*BIG_AUD*	*AF*	*FRAUD*
NC_RATE	—	−0.202 0.001	−0.122 0.050	−0.192 0.003	−0.102 0.146	−0.165 0.047
NOL	−0.219 0.001	—	−0.143 0.089	0.125 0.136	−0.164 0.050	0.013 0.442
HI_CASH	−0.108 0.087	−0.143 0.089	—	0.051 0.355	0.134 0.076	−0.117 0.033
BIG_AUDIT	−0.196 0.001	0.125 0.136	0.051 0.355	—	0.232 0.005	−0.087 0.098
AF	−0.222 0.019	−0.164 0.050	0.134 0.076	0.232 0.005	—	0.037 0.316
FRAUD	−0.183 0.041	0.013 0.442	−0.117 0.033	−0.087 0.098	0.037 0.316	—

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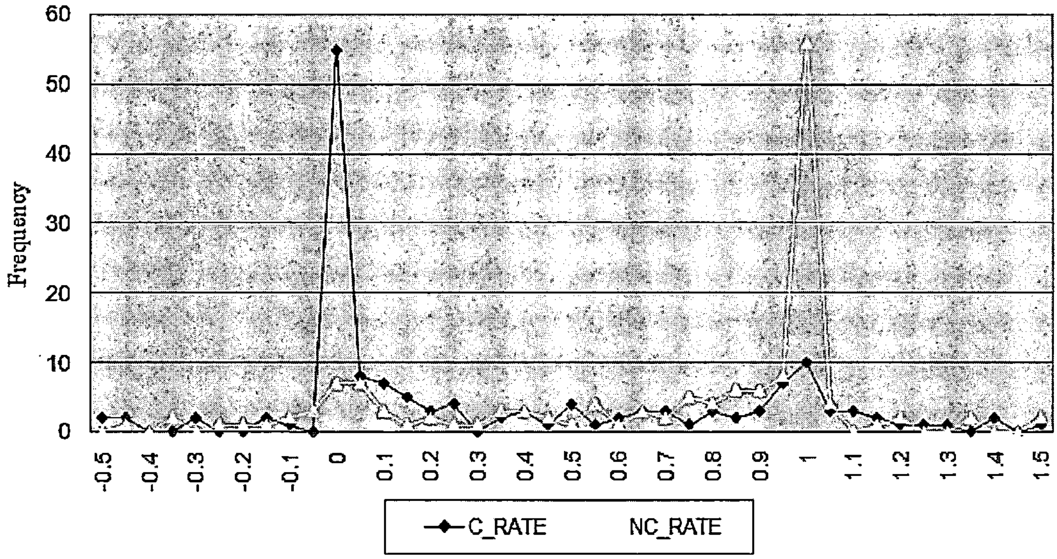
[a] A one-tailed test of whether the mean (median) *NC_RATE* exceeds the mean (median) *C_RATE* is significant at the 0.01 level.

See Appendix D for complete variable definitions.

fraud and/or were associated with the firing of a top executive. Panel B shows that *NC_RATE* is significantly and negatively correlated (both Pearson and Spearman correlations) with the presence of NOLs and with high operating cash flows, the two factors we predict reduce the expected tax benefits related to nonconforming earnings management. *NC_RATE* is also significantly negatively correlated with the three factors that we predict increase

FIGURE 1
Distributions of *C_RATE* and *NC_RATE*



See Appendix D for complete variable definitions.

expected detection costs (*BIG_AUDIT*, *FRAUD*, and *AF*), although for *AF* only the Spearman correlation is significant.[36]

We provide additional univariate evidence by comparing the mean and median proportions of conforming and nonconforming earnings management (i.e., *C_RATE* and *NC_RATE*) in several contexts. Table 3, Panel A, displays the proportions of conforming and nonconforming earnings management by reason for the misstatement.[37] For the eight income-increasing misstatements that were due solely to irregularities in revenue recognition, all employed nonconforming earnings management strategies. Among the 18 firms having misstatements due solely to expense recognition irregularities, the mean and median *NC_RATE*s (73.4 and 96.7 percent, respectively) are significantly greater than the mean and median *C_RATE*s (26.6 and 0 percent, respectively). Moreover, this pattern of differences also holds for the remaining 125 misstatements that impact a variety of accounts.[38]

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[36] Untabulated correlations among the Equation (6) independent variables indicate that virtually all correlations are small in magnitude. One exception is the Spearman correlation between *BLOAT* and *LAG_TA*, which is 0.609 (Pearson correlation is 0.345).

[37] Scholz (2008, 14) reports: "Ascertaining the accounting issues underlying these restatements can be difficult. Some companies describe errors by account (e.g., revenue is overstated), and others by the nature of the error (e.g., improper accounting for employee stock options). It is often unclear how the latter descriptions tie to specific financial statement elements, and thus it is not possible to consistently code by specific account."

[38] We obtain similar results when we use the rate of temporary nonconforming earnings management.

TABLE 3
Proportions of Conforming and Nonconforming Earnings Management

Panel A: By Reason for Misstatement[a]

		C_RATE		*NC_RATE*	
	Observations	**Mean**	**Median**	**Mean**	**Median**
Revenue Only	8	0.0%***	0.0%***	100.0%	100.0%
Expense Only	18	26.6%***	0.0%***	73.4%	96.7%
All other Combinations	125	39.1%***	15.2%***	60.9%	84.7%
Total Firms	151				

Panel B: By Industry Classification

	Non-Misstatement Sample[b]		Misstatement Sample			
Industry	**# Obs.**	**Percent**	**# Obs.**	**Percent**	***C_RATE***	***NC_RATE***
Transportation	234	2.94%	5	3.31%	11.23%	88.77%
Utilities	189	2.38%	3	1.99%	96.70%	3.30%
Services	903	11.36%	28	18.54%	39.30%	60.70%
Retail	755	9.50%	24	15.89%	28.20%	71.80%
Food	5	0.06%	2	1.32%	72.20%	27.80%
Extractive	191	2.40%	2	1.32%	0.27%	99.73%
Textiles and Printing/Publishing	162	2.04%	7	4.64%	41.36%	58.64%
Chemicals	118	1.48%	2	1.32%	100.00%	0.00%
Computers	1,985	24.97%	29	19.21%	33.10%	66.90%
Pharmaceuticals	670	8.43%	5	3.31%	19.43%	80.57%
Mining and Construction	64	0.81%	4	2.65%	40.38%	59.62%
Durable Manufacturers	2,421	30.46%	32	21.19%	44.20%	55.80%
Financials	251	3.16%	8	5.30%	29.62%	70.38%
Total Observations	7,948	100%	151	100%		

(continued on next page)

TABLE 3 (continued)

Panel C: By Partitioning Based on *NOL, HI_CASH, BIG_AUDIT, AF,* and *FRAUD*[c]

Proxies for Net Present Value of Tax Benefits Related to Nonconforming Earnings Management	*C_RATE*	*NC_RATE*
NOL = 0	36.2%***	63.8%***
NOL = 1	47.9%	52.1%
HI_CASH = 0	42.3%*	57.7%*
HI_CASH = 1	51.8%	48.2%

Proxies for Net Expected Detection Costs Related to Nonconforming Earnings Management	*C_RATE*	*NC_RATE*
BIG_AUDIT = 0	20.4%***	79.6%***
BIG_AUDIT = 1	40.3%	59.7%
AF = 0	33.1%	66.9%
AF = 1	38.6%	61.5%
FRAUD = 0	35.0%***	65.0%***
FRAUD = 1	48.7%	51.3%

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[a] *** Statistically significant at the 0.10, 0.05, 0.01 level, respectively, using a one-tailed test of differences in proportions within each row. For example, *C_RATE* for Revenue Only (0.0%) is compared to *NC_RATE* for Revenue Only (100.0%).

[b] For descriptive purposes, we use Barth et al.'s (2001) industry classifications: Mining and Construction (1000–1999, excluding 1300–1399), Food (2000–2111), Textiles and Printing/Publishing (2200–2780), Chemicals (2800–2824, 2840–2899), Pharmaceuticals (2830–2836), Extractive (2900–2999), 1300–1399), Durable Manufactures (3000–3999, excluding 3570–3579 and 3670–3679), Computers (7370–7379, 3570–3579, 3670–3679), Transportation (4000–4899), Utilities (4900–4999), Retail (5000–5999), and Services (7000–8999), excluding 7370–7379).

[c] *, *** Statistically significant at the 0.10, 0.05, 0.01 level, respectively, using a one-tailed test of differences in proportions for each column. For example, *C_RATE* for NOL = 0 (36.2%) is compared to *C_RATE* for NOL = 1 (47.9%).

See Appendix D for complete variable definitions.

Panel B of Table 3 presents the mean proportions of *NC_RATE* and *C_RATE* by industry for the misstatement firms. For the eight industries with at least five sample firms, *NC_RATE* exceeds *C_RATE* in all eight cases. Note that there is a mix of conforming and nonconforming earnings management across most industries represented in the sample.

Finally, Panel C of Table 3 shows the mean proportions of each earnings management type for the two tax benefit and three detection cost variables we predict reduce a firm's reliance on nonconforming earnings management. We expect that in the presence of each of these factors (e.g., *NOL* = 1), the mean *C_RATE* (*NC_RATE*) will be higher (lower) than when these factors are not present. The results are consistent with these expectations in eight of the ten comparisons; i.e., the proportion of conforming (nonconforming) earnings management increases (decreases) as each of the four factors (*NOL*, *HI_CASH*, *BIG_AUDIT*, and *FRAUD*) goes from a value of 0 to 1, and the differences are significant. The *AF* results are not significant.

Multivariate Analysis

Table 4, Panels A and B, presents descriptive statistics for our misstatement firms (n = 151) and the control sample of non-misstatement firms (n = 7,948), respectively. The latter sample includes all Compustat firms not in the GAO (2002) restatement sample that are matched with the misstatement firms on industry (three-digit SIC) and fiscal year and that have the necessary data. Misstatement firms have significantly greater mean and median deferred tax expense (*DTE*), total book-tax differences (*BT_DIFF*), and abnormal accruals (*MJAC*) than non-misstatement firms. There is also evidence that misstatement firms have higher market-to-book ratios (*MTB*), a greater propensity to exceed the prior quarter's earnings (*EPS_G*) and beat analyst forecasts (*MBE*), a greater likelihood of raising funds externally (*FIN_R*) and of using operating leases (*OP_LEASES*), and greater increases in accounts receivable (ΔAR) and inventories (ΔINV) in year *t*. They also are less likely to use a Big 4/5/6 auditor (*BIG_AUDIT*) and be a multinational entity (*MNC*). On the other hand, misstatement firms are similar to the non-misstatement control firms on several important dimensions, including current tax expense, leverage, interest coverage, consecutive strings of meeting analyst forecasts, analyst following, firm size, cash flows from operations, and changes in CFO, earnings and number of employees. (Table 3, Panel B displays the industry composition for the misstatement and control samples.)

Table 5, Panel A presents the results of estimating Equation (7), our prediction model and step one in the Heckman (1979) two-step estimation approach. With regard to indicators of current period earnings management, the results suggest that coefficients on both *BT_DIFF* and *MJAC* are positive and significant, indicating that the book-tax difference variable is incrementally useful beyond abnormal accruals in predicting earnings restatements (and thus income-increasing earnings management), and that *MJAC* is similarly incrementally useful to *BT_DIFF*. This result is consistent with total book-tax differences being useful in detecting upward earnings management.[39]

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[39] In untabulated results, we substitute deferred tax expense (*DTE*) for *BT_DIFF* in Equation (7) to focus on temporary rather than total book-tax differences. The results yield similar inferences to those based on total book-tax differences (i.e., the coefficient on *DTE* is positive and significant). These results extend those in Phillips et al. (2003), which finds that deferred tax expense is incrementally useful to accrual-based variables in detecting upward earnings management to achieve certain earnings targets.

TABLE 4
Comparative Descriptive Statistics for Income-Increasing Misstatement Firms versus a Control Sample of Non-Misstatement Firms

Panel A: Misstatement Sample (originally reported data)

				Percentiles		
	n	**Mean**	**Std. Dev.**	**75th**	**50th**	**25th**
CTE	151	0.017	0.033	0.031	0.005	0.000
DTE	151	−0.003**	0.027	0.004	0.001*	−0.007
BT_DIFF	151	0.018***	0.173	0.082	0.004**	−0.077
MJAC	151	0.048***	0.232	0.096	0.031***	−0.064
MBE	151	0.697**	0.435	1	1	0
MTB	151	4.242**	2.997	5.159	3.886**	2.048
FIN_R	151	0.311***	0.346	0.417	0.115	0.029
LEV	151	0.25	0.211	0.391	0.221	0.068
INV_INTCOV	151	0.541	0.889	0.359	0.259	0.116
EPS_G	151	2.546**	1.875	4	2*	1
STRING	151	3.44	2.798	5	2	1
CFO	151	−0.022	0.114	0.085	0.018	−0.061
ΔCFO	151	−0.049	0.167	0.033	−0.019	−0.133
BIG_AUDIT	151	0.748***	0.355	1	1	0
AF	151	0.682	0.515	1	1	0
MNC	151	0.319**	0.467	1	0	0
LAG_TA	151	1,275	2,655	908	115	43
ΔAR	151	0.059**	0.184	0.049	0.032***	0.013
ΔINV	151	0.037***	0.181	0.034	0.006**	0.001
ΔCASHSALES	151	0.242	0.196	0.201	0.143	0.034
ΔEARN	151	−0.016	0.205	0.012	−0.011	−0.007
ABNΔEMPLOYEES	151	−0.0283	0.318	0.005	−0.006	−0.016
OP_LEASES	151	0.888**	0.316	1	1	1

Panel B: Non-Misstatement Firms[a]

				Percentiles		
	n	**Mean**	**Std. Dev.**	**75th**	**50th**	**25th**
CTE	7,948	0.022	0.023	0.024	0.011	0.000
DTE	7,948	−0.013	0.022	0.006	−0.021	−0.127
BT_DIFF	7,948	−0.011	0.168	0.052	−0.015	−0.096
MJAC	7,948	−0.065	0.243	0.125	−0.050	−0.289
MBE	7,948	0.513	0.422	1	1	0
MTB	7,948	3.646	4.814	4.163	2.023	1.033
FIN_R	7,948	0.213	0.217	0.289	0.067	0.044
LEV	7,948	0.293	0.254	0.542	0.292	0.046
INV_INTCOV	7,948	0.541	0.879	0.345	0.256	0.136
EPS_G	7,948	2.063	1.925	3	1	0
STRING	7,948	2.654	2.740	5	2	0
CFO	7,948	−0.031	0.223	0.071	0.017	−0.183

(*continued on next page*)

TABLE 4 (continued)

	n	Mean	Std. Dev.	Percentiles		
				75th	**50th**	**25th**
ΔCFO	7,948	0.028	0.214	0.033	0.000	−0.073
BIG_AUDIT	7,948	0.872	0.323	1	1	1
AF	7,948	0.781	0.471	1	1	1
MNC	7,948	0.485	0.499	1	0	0
LAG_TA	7,948	1,627	2,948	1,504	543	54
ΔAR	7,948	0.025	0.154	0.028	0.013	0.002
ΔINV	7,948	0.002	0.152	0.022	0.002	0.000
ΔCASHSALES	7,948	0.186	0.176	0.165	0.077	0.016
ΔEARN	7,948	−0.009	0.153	0.009	−0.007	−0.003
ABNΔEMPLOYEES	7,948	−0.018	0.259	0.103	−0.019	−0.109
OP_LEASES	7,948	0.763	0.187	1	1	1

*, **, *** Statistically significant at the 0.10, 0.05, 0.01 level, respectively, between misstatement and non-misstatement firms.

[a] Non-misstatement firms represent all Compustat firms not appearing in the GAO restatement sample and matched on three-digit SIC and year of the misstatement.

See Appendix D for complete variable definitions.

The results from estimating the prediction model in Panel A dealing with incentives (or the lack thereof) to manage earnings upward suggest the following significant effects: the probability of restatement is positively related to meeting or beating analyst forecasts (*MBE*) and prior quarterly earnings targets (*EPS_G*), and to seeking external financing (*FIN_R*). In addition, *RESTATE* is negatively related to the following variables: *BIG_AUDIT*, consistent with firms having high-quality external auditors being less likely to restate earnings, and firm size (*LAG_TA*) and multinational activities (*MNC*), suggesting that larger firms and multinational firms are also less likely to restate. There is also evidence that *RESTATE* is more likely when receivables and inventories increase and operating cash flows decrease (Δ*CFO*). The last result suggests earnings management is less likely to occur when operating performance improves.[40]

Our main results reflect tests of H1 and H2 and are shown in Panel B of Table 5. These results are from estimating our multivariate earnings management strategy choice model, Equation (6), which is the second step in the Heckman (1979) two-step approach.[41] As predicted by H1, the proportion of nonconforming earnings management declines in the presence of NOL carryforwards and high levels of free cash flow, although the results are significant at conventional levels only for NOL carryforwards. The coefficient on *NOL*, −0.192, suggests that firms with NOLs engage in 19.2 percent more book-tax *con*forming earnings management, which is consistent with firms engaging in less nonconforming

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[40] The results also show that restatements are more likely when earnings increase. We include both Δ*CFO* and Δ*EARN* in the prediction model; this implies that the coefficient on Δ*EARN* captures the change in accruals, and thus the results suggest that restatements are more likely when accruals increase, which is what we would expect. Note that the correlation between Δ*CFO* and Δ*EARN* is 0.42.

[41] The results in the text are based on estimating Equation (6) using the inverse Mills ratio derived from estimating Equation (7), which includes *BT_DIFF* as a regressor. Untabulated results from estimating Equation (6) using the inverse Mills ratio derived from estimating Equation (7) and including *DTE* instead of *BT_DIFF* are very similar.

TABLE 5
Results from Heckman (1979) Two-Step Regressions

Panel A: Results from the First Stage of Heckman Estimation—Selection Model

$$\begin{aligned} RESTATE_i = {} & \beta_0 + \beta_1 BT\_DIFF_i + \beta_2 MJAC_i + \beta_3 MBE_i + \beta_4 MTB_i + \beta_5 FIN\_R_i \\ & + \beta_6 LEV_i + \beta_7 INV\_INTCOV_i + \beta_8 EPS\_G_i + \beta_9 STRING_i + \beta_{10} CFO_i \\ & + \beta_{11} \Delta CFO_i + \beta_{12} BIG\_AUDIT_i + \beta_{13} AF_i + \beta_{14} MNC_i + \beta_{15} LAG\_TA_i \\ & + \beta_{16} \Delta AR_i + \beta_{17} \Delta INV_i + \beta_{18} \Delta CASHSALES_i + \beta_{19} \Delta EARN_i \\ & + \beta_{20} ABN\Delta EMPLOYEES_i + \beta_{21} OP\_LEASES_i + \beta_j \Sigma_j INDUS_i + \varepsilon_i. \end{aligned} \tag{7}$$

	Predicted Sign	Coefficient	p-value
Intercept	+/−	−1.942	0.001
BT_DIFF	+	2.781	0.042
MJAC	+	0.588	0.067
MBE	+	0.198	0.067
MTB	+	0.061	0.331
FIN_R	+	1.187	0.001
LEV	+	−0.020	0.485
INV_INTCOV	+	0.192	0.380
EPS_G	+	0.282	0.045
STRING	+	0.037	0.275
CFO	−	−0.005	0.462
ΔCFO	−	−1.417	0.077
BIG_AUDIT	−	−0.147	0.007
AF	−	0.031	0.119
MNC	+/−	−0.179	0.078
LAG_TA	+/−	−0.026	0.027
ΔAR	+	1.145	0.017
ΔINV	+	2.089	0.005
ΔCASHSALES	+	−0.023	0.388
ΔEARN	−	1.988	0.049
ABNΔEMPLOYEES	−	−0.122	0.445
OP_LEASES	+	0.268	0.352
Pseudo R^2		31%	
n		8,099	

Panel B: Results from the Second Stage of Heckman Estimation—Choice Model

$$\begin{aligned} NC\_RATE_i = {} & \alpha_0 + \alpha_1 NOL_i + \alpha_2 HI\_CASH_i + \alpha_3 BIG\_AUDIT_i + \alpha_4 AF_i + \alpha_5 FRAUD_i \\ & + \alpha_6 MTB_i + \alpha_7 BLOAT_i + \alpha_8 LAG\_NDTL_i + \alpha_9 LAG\_TA_i \\ & + \alpha_{10} SC\_PT\_EM_i + \alpha_{11} MNC_i + \alpha_{12} REV\_ONLY_i + \alpha_{13} EXP\_ONLY_i \\ & + \alpha_{14} INV\_MILLS_i + \alpha_j \Sigma_j INDUS_i + \varepsilon_i \end{aligned} \tag{6}$$

	Predicted Sign	Coefficient	p-value
Intercept	+/−	0.549	0.013
NOL	−	−0.192	0.024
HI_CASH	−	−0.113	0.127

(*continued on next page*)

TABLE 5 (continued)

	Predicted Sign	Coefficient	p-value
BIG_AUDIT	−	−0.273	0.037
AF	−	−0.022	0.402
FRAUD	−	−0.131	0.048
MTB	−	−0.003	0.214
BLOAT	−	0.000	0.318
LAG_NDTL	−	−0.091	0.054
LAG_TA	+/−	0.044	0.042
SC_PT_EM	−	0.193	0.260
MNC	+/−	−0.018	0.438
REV_ONLY	+/−	0.498	0.034
EXP_ONLY	+/−	0.121	0.092
INV_MILLS	+	0.014	0.323
Adjusted R^2		35%	
n		151	

n = 151 misstatement firms and n = 7,948 non-misstatement firms.
Industry coefficients are included but not reported.
p-values are one-tailed if there is a predicted sign, two-tailed otherwise.
See Appendix D for complete variable definitions.

earnings management when the net present value of the associated tax benefits is lower.[42]

As predicted by H2, *NC_RATE* is lower when firms have a Big 4/5/6 auditor and when it is alleged that firms have committed fraud and/or a top executive is fired. The coefficient on *BIG_AUDIT* indicates that firms using a Big 4/5/6 auditor engage in 27.3 percent more book-tax conforming earnings management. Similarly, firms engaging in fraud or that fire a top executive in connection with the restatement employ 13.1 percent more conforming earnings management. The latter result is consistent with Erickson et al. (2004), who document that their sample of fraudulently reporting firms relied on substantial amounts of conforming earnings management. Overall, these results suggest that firms substitute conforming for nonconforming earnings management when net expected detection costs associated with nonconforming earnings management are higher, as they would be with high-quality audit firms and for firms identified *ex post* as having engaged in the most egregious forms of earnings management.[43]

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[42] In additional analyses, we redefine *NOL* by grossing-up deferred tax assets related to NOL carryforwards by the tax rate (35 percent) and then compute *NOL_Ratio*, which relates the estimated amount of NOL carryforwards to the amount of originally reported pretax income (which includes the amount of the upward managed earnings). For misstatement firms with positive pretax income, *NOL_Ratio* = 3.68 for firms that predominantly used conforming upward earnings management versus *NOL_Ratio* = 0.75 for nonconforming misstatement firms, which is consistent with firms with sufficient amounts of NOL carryforwards relying on relatively more conforming earnings management since conforming earnings management imposes no additional tax costs on them. We then define *NOLRatio_Dum* to equal 1 if a firm's NOL carryforwards exceed the amount of original pretax income (and 0 otherwise). This variable indicates whether the firm has sufficient NOL carryforwards to absorb the effects of its upward conforming earnings management. We replace our *NOL* variable with *NOLRatio_Dum* and re-estimate Equations (6) and (7). The results are consistent with those in Table 5, Panel B. In particular, the coefficients on *NOLRatio_Dum*, *BIG_AUDIT*, and *FRAUD* are all negative and significant at conventional levels.

Several control variables are also significant. First, after controlling for the kind of account misstated, the coefficient on *REV_ONLY* is significantly positive, contrary to conventional wisdom that revenue-related earnings management is mostly conforming. In addition, the coefficient on *EXP_ONLY* is also positive and significant. More importantly, these results indicate that even though a firm's propensity to engage in nonconforming earnings management strategies is in part determined by the kind of account managed, the effects predicted by H1 and H2 remain significant. We also find that *NC_RATE* is higher for firms with smaller *LAG_NDTL*, consistent with firms being less constrained to employ nonconforming earnings management if their balance sheet reflects less "bloat" with regard to deferred taxes. *NC_RATE* also increases with firm size, indicating that larger firms have more opportunities for nonconforming earnings management. Last, *INV_MILLS* is positive but insignificant, which suggests that self-selection bias is not a major problem in our sample, our prediction model is not very good, or the sample of misstatement firms is too small to meaningfully test *INV_MILLS*.[44]

The multivariate results generally support H1 and H2 and suggest that firm-specific characteristics that reduce the net present value of tax benefits or increase the net expected detection costs related to nonconforming earnings management are associated with firms that engage in more conforming and less nonconforming pretax earnings management.

VI. SUMMARY AND CONCLUSIONS

We examine tax and nontax implications of pretax earnings management by investigating the relative amounts of two types of earnings management: book-tax conforming and book-tax nonconforming. We base our analyses on a sample of firms that restated their earnings downward (and thus had managed earnings upward), and we measure earnings management as the difference between originally reported and restated pretax earnings.

Using hand-collected data from the misstatement firms' financial reports, including originally reported and restated pretax income and current income tax expense, we calculate the relative amounts of both types of earnings management strategies. We find that nonconforming earnings management accounts for the larger proportion of total pretax earnings management, and we show that book-tax differences are incrementally useful in predicting earnings restatements. Most important, we provide evidence that firm-specific characteristics—presence of NOL carryforwards, use of a high-quality external auditor, and more egregious earnings management—are associated with firms engaging in more conforming earnings management than they otherwise would have. Our results are consistent with misstatement firms trading off the net present value of tax benefits against the net expected detection costs associated with nonconforming earnings management when deciding whether to engage in conforming versus nonconforming upward earnings management strategies.

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[43] We perform several untabulated analyses that yield qualitatively similar results. First, we examine *FRAUD* = 0 and *FRAUD* = 1 firms separately, and find that *NOL* and *BIG_AUDIT* are significant for the non-fraud and fraud firms, and *HI_CASH* is significant for fraud firms. Second, we re-run analyses after dropping the 13 firms with restatements reflecting 100 percent permanently nonconforming strategies. Third, we estimate the second-stage *NC_RATE* regression using logit, where the continuous *NC_RATE* variable is converted to 0 for values less than 50 percent (1 otherwise). Fourth, due to concerns regarding measurement error in computing *C_RATE* for firms with foreign operations, we re-run our main analyses excluding firms reporting foreign income (or loss).

[44] Stolzenberg and Relles (1997) argue that if selection bias is moderate or if samples have only a few hundred observations, which is the case here, then the two-step estimation approach can make estimates worse. In untabulated results we re-estimate Equation (7) after excluding *INV_MILLS* and our main inferences are unchanged.

To our knowledge, this study is the first to investigate both tax *and* nontax factors that affect the conforming versus nonconforming choices that managers face when managing pretax earnings, and to utilize the restatement setting to more accurately measure both pretax earnings management and changes in taxable income resulting from such earnings management. Our results lead to a better understanding of the book-tax trade-offs managers face when managing earnings upward. We bridge and contribute to two streams of literature: studies that document conforming earnings management to achieve tax savings, and studies where managers prefer to manage earnings in ways that do not incur current tax costs. By investigating the factors that lead to less nonconforming earnings management and utilizing a more general sample of earnings managers (misstatement firms in general versus firms committing fraud), we extend the work of Erickson et al. (2004).

We acknowledge that GAO misstatement firms may reflect some earnings management behavior not typically seen in the larger population of publicly traded U.S. companies. Thus, our results may not generalize to the entire population. We note, however, that the most common kinds of accounting irregularities for our misstatement sample—revenue and expense recognition—are consistent with the most common areas of earnings management identified in Nelson et al. (2002) and Phillips et al. (2004). Finally, our analyses focus on pretax earnings management and thus we cannot speak to the relative magnitudes of pretax earnings management compared to income tax accrual management, as investigated by Dhaliwal et al. (2004), among others.

APPENDIX A

PRESENT VALUE OF TAX BENEFITS ASSOCIATED WITH NONCONFORMING EARNINGS MANAGEMENT

Assume that in the current year t and also in year $t + n$, a firm has \$100 of "true" pretax book income. The firm engages in \$10 of earnings management and thus originally reports \$110 of pretax income in year t. Assume further that the earnings management reverses in year $t + n$ and the firm reports pretax income of \$90.

If the above earnings management is performed in a conforming manner and the income tax rate is 35 percent, then the firm would incur tax costs of \$38.50 in year t (\$110 × 35 percent) and \$31.50 in year $t + n$ (\$90 × 35 percent). The present value of tax costs would be $\$38.50 + [\$31.50/(1 + r)^n]$, where r is the firm's discount rate.

If the earnings management is performed in a nonconforming manner, then the firm would incur tax costs of \$35 (\$100 × 35 percent) in both years t and $t + n$, since nonconforming earnings management does not affect taxable income (in this case, \$100). The present value of tax costs would be $\$35 + [\$35/(1 + r)^n]$. If the nonconforming earnings management results in a temporary book-tax difference, then the second term takes on a positive value; however, if the nonconformity results in a permanent book-tax difference, the second term drops out and the tax costs would be \$35.

The tax benefit from engaging in nonconforming versus conforming upward earnings management equals the net present value of tax benefits from doing so, i.e., the present value of tax costs associated with conforming earning management minus the present value of tax costs associated with nonconforming earnings management. This amount is computed as:

$$\begin{aligned}&\{\$38.50 + [\$31.50/(1 + r)^n]\} - \{\$35 + [\$35/(1 + r)^n]\}\\&= \$3.50 - [\$3.50/(1 + r)^n].\end{aligned}$$

More formally, the present value of tax benefits from managing earnings in a nonconforming manner in the current period is:

$$PVTB_{NC} = PT\_EM \times STR\,\{1 - [1/(1 + r)^n]\}$$

where PT_EM is the amount of pretax earnings management and STR is the maximum corporate statutory tax rate (35 percent). Note that:

$$\partial PVTB_{NC}/\partial r > 0;$$

$$\partial PVTB_{NC}/\partial N > 0;$$

$$\partial PVTB_{NC}/\partial PT\_EM > 0; \text{ and}$$

$$\partial PVTB_{NC}/\partial STR > 0.$$

APPENDIX B
DETAILED COMPUTATION OF *CONFORM_EM*

Assume a firm has $80 of "true" pretax book income and engages in $10 each of conforming and nonconforming earnings management, and thus originally reports $100 of pretax income. For simplicity, assume the firm has no temporary book-tax differences except those created by earnings management, has no permanent book-tax differences, and has no foreign earnings. Further, assume the firm has no deferred tax liabilities or deferred tax asset valuation allowance account (VAA) at the beginning of the year, and the firm's only deferred tax asset of $350 relates to a $1,000 NOL carryforward. The applicable statutory tax rate is 35 percent.

When its accounting irregularities become known, the firm restates its pretax income to $80. The firm originally reported $90 of taxable income ($80 of pretax income plus $10 of conforming earnings management). The firm has no current tax expense given its NOL carryforwards, which were originally reduced to $910 (from $1,000) and valued at $318.50 ($910 × 35 percent) on the year-end balance sheet as a deferred tax asset. The $10 of nonconforming earnings management created a $3.50 ($10 × 35 percent) deferred tax liability. These items lead to $35.00 of originally reported deferred tax expense.

Upon restatement, the firm only has $80 of taxable income because there are no book-tax differences. The firm still reports zero current tax expense, but the $1,000 NOL carryforward is now only reduced to $920 and valued at $322 ($920 × 35 percent) on the year-end balance sheet. In addition, the firm no longer has a deferred tax liability at year-end because the earnings restatement removed the temporary book-tax differences. These items lead to $28 of restated deferred tax expense.

The originally reported and restated pretax income and income tax expense amounts are as follows:

	Original	**Restated**	**Difference**
Pretax Income	$100.00	$80.00	$20.00
Current Tax Expense	0.00	0.00	0.00
Deferred Tax Expense	35.00	28.00	7.00
Total Tax Expense	35.00	28.00	$7.00
Net Income Per Books	$65.00	$52.00	
Taxable Income	$90.00	$80.00	

The difference between originally reported and restated pretax income (*PT_EM*) is \$20; the difference between originally reported and restated federal current tax expense (ΔFED_CTE) is \$0.[45] We emphasize that the restatement of deferred tax assets related to NOL carryforwards erroneously causes the change in current tax expense to understate the tax effect of conforming earnings management (\$0 instead of \$3.50) and the change in deferred tax expense to overstate the tax effect of nonconforming earnings management (\$7 instead of \$3.50). We correct for such measurement error by computing our proxies for conforming and nonconforming earnings management. First, we compute $\Delta FEDNOL\_DTA$ as the difference between the original and restated change in the NOL deferred tax asset or [(\$318.50 − \$350.00) − (\$322.00 − \$350.00)], which equals −\$3.50.

With $\Delta FEDNOL\_DTA$ equal to −\$3.50, we then compute the dollar amount of the conforming earnings management proxy and the rates of conforming and nonconforming earnings management as follows:

$$\begin{aligned} CONFORM\_EM &= (\Delta FED\_CTE - \Delta FEDNOL\_DTA)/FED\_RATE \\ &= [0 - (-\$3.50)]/.35 = \$3.50/.35 = \$10; \\ C\_RATE &= \$10/\$20 = 0.5; \text{ and} \\ NC\_RATE &= 1 - 0.5 = 0.5. \end{aligned}$$

APPENDIX C
TWO EXAMPLES FROM MISSTATEMENT SAMPLE

Versatility Inc. restated its fiscal year 1996 financial statements for the accounting treatment of certain transactions including revenue recognition criteria and timing, bad debt reserves, and other expense-related items. We determine that approximately 73 percent of Versatility's earnings management was book-tax conforming, as shown below.

	Versatility Inc.		
Year: 1996 (in millions)	**Original**	**Restated**	**Difference**
Federal Pretax Net Income	3.01	−8.87	11.88
Foreign Pretax Net Income	−0.10	0.70	−0.80
Total Pretax Net Income	**2.91**	**−8.18**	**11.09**
Current Tax Provision			
Federal	1.02	−0.33	1.35
Foreign	0.01	0.10	−0.09
State	0.23	−0.10	0.33
Total Current Provision	1.26	−0.32	1.59
Deferred Tax Provision:			
Federal	−0.24	0	−0.24
Foreign	0	0	0
State	−0.06	0	−0.06
Total Deferred Provision	−0.30	0	−0.30
Total Tax Provision	**0.96**	**−0.32**	**1.29**

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[45] See Appendix D for complete variable definitions.

DTAs from NOLs at year-end t	0	1.76	−1.76
DTAs from NOLs at year-end $t-1$	0	0	0
Change in DTAs from NOLs	0	1.76	−1.76
C_RATE			**73.05%**[46]
NC_RATE			**26.95%**

Pre-Paid Legal Services Inc. restated its 1999 financial statements and significantly lowered reported earnings per share due to revenue and expense recognition practices. We determine that approximately 97 percent of Pre-Paid Legal Services' earnings management was book-tax nonconforming, as shown below.

	Pre-Paid Legal Services, Inc.		
Year: 1999 (in millions)	**Original**	**Restated**	**Difference**
Federal Pretax Net Income	59.93	18.51	41.42
Foreign Pretax Net Income	0.0	0.0	0.0
Total Pretax Net Income	**59.93**	**18.51**	**41.42**
Current Tax Provision:			
Federal	5.34	4.9	0.44
State	1.07	1.07	0
Total Current Provision	6.41	5.96	0.44
Deferred Tax Provision:			
Federal	14.57	0.52	14.05
Total Deferred Provision	14.57	0.52	14.05
Total Tax Provision	**20.97**	**6.48**	**14.49**
DTAs from NOLs at year-end t	0	0	0
DTAs from NOLs at year-end $t-1$	1.05	1.05	0
Change in DTAs from NOLs	−1.05	−1.05	0
C_RATE			**3.04%**[47]
NC_RATE			**96.96%**

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[46] To compute C_RATE, we estimate the foreign tax rate that applies to the restated foreign earnings as $FOR\_RATE = \Delta FOR\_CTE / FORPT\_EM = -0.09/-0.80 = 0.1125$. Because deferred tax assets related to foreign NOLs are zero at the beginning of the year, we allocate the total decrease in deferred tax assets related to NOLs to the U.S. jurisdiction (i.e., $\Delta FEDNOL\_DTA = -1.76$ and $\Delta FORNOL\_DTA = 0.00$). Using these components and data from the table above, we compute $C\_RATE = \{[(\Delta FEDCTE - \Delta FEDNOL\_DTA)/.35] + [(\Delta FORCTE - \Delta FORNOL\_DTA)/FOR\_RATE)]\}/\Delta PT\_EM = \{[[1.35 - (-1.76)]/0.35] + [(-0.09 - 0)/(0.1125)]\}/11.09 = 73.05$ percent.

[47] To compute C_RATE, we estimate the foreign tax rate that applies to the restated foreign earnings as $FOR\_RATE = \Delta FOR\_CTE/\Delta FORPT\_EM = 0$, based on the information above. Because there is no change in deferred tax assets related to NOLs, $\Delta FEDNOL\_DTA = 0$ and $\Delta FORNOL\_DTA = 0$. Using these components and data from the table above, we compute $C\_RATE = \{[(\Delta FEDCTE - \Delta FEDNOL\_DTA)/.35] + [(\Delta FORCTE - \Delta FORNOL\_DTA)/FOR\_RATE)]\}/\Delta PT\_EM = \{[(0.44 - 0)/0.35] + 0\}/41.42 = 3.04$ percent.

APPENDIX D
VARIABLE DEFINITIONS

Variables to Compute *CONFORM_EM* (Conforming Earnings Management):

$$CONFORM\_EM = \frac{(\Delta FED\_CTE - \Delta FEDNOL\_DTA)}{FED\_RATE} + \frac{(\Delta FOR\_CTE - \Delta FORNOL\_DTA)}{FOR\_RATE}$$

ΔFED_CTE = difference between the originally reported and restated federal current tax expense;
$\Delta FEDNOL\_DTA$ = change in federal deferred tax assets related to NOL carryforwards computed as $\Delta NOL\_DTA \times (FEDPT\_EM/PT\_EM)$;
ΔNOL_DTA = difference between the originally reported and restated change in deferred tax assets related to NOL carryforwards;
$FEDPT\_EM$ = difference between the originally reported and restated U.S. pretax income;
PT_EM = difference between the originally reported and restated total pretax income;
FED_RATE = maximum corporate federal statutory tax rate, which was 35 percent throughout our sample period;
ΔFOR_CTE = difference between the originally reported and restated foreign current tax expense;
$\Delta FORNOL\_DTA$ = change in foreign deferred tax assets related to NOL carryforwards computed as $\Delta NOL\_DTA \times (FORPT\_EM/PT\_EM)$;
$FORPT\_EM$ = difference between the originally reported and restated foreign pretax income; and
FOR_RATE = foreign tax rate computed as $(\Delta FOR\_CTE)/(FORPT\_EM)$.

Variables Used in Equation (6):

NC_RATE = firm i's proportion of nonconforming earnings management, computed as $(1 - C\_RATE)$ in year t; $C\_RATE = CONFORM\_EM/PT\_EM$;
NOL = 1 if firm i has net operating loss carryforwards available at the beginning of year t, and 0 otherwise;
HI_CASH = 1 if firm i is in the top one-third of the $FREECASH$ distribution for misstatement firms during year $t-1$, and 0 otherwise;
$FREECASH$ = Cash flow from operating activities (Compustat #308) minus capital expenditures (#128) plus sales of property, plant, and equipment (#107) minus acquisitions (#129) in year $t-1$, scaled by total assets (#6) at year-end $t-2$;
BIG_AUDIT = 1 if firm i is audited by a Big 4/5/6 auditor (#149 value of 1–7) in year t, and 0 otherwise;
AF = 1 if firm i has any analyst following in year t, and 0 otherwise;
$FRAUD$ = 1 if a misstatement firm *ex post* was alleged to have engaged in accounting fraud and/or the misstatement firm replaced its CEO, CFO, or President in association with the restatement, and 0 otherwise;

MTB = firm *i*'s market-to-book ratio, calculated as market value of equity (#25 × #199) at year-end $t-1$ divided by the book value of equity (#60) at year-end $t-1$;

REV_ONLY = 1 if the difference between the original and restated pretax net income is equal to the difference between the original and restated revenue for firm *i* in year *t*, and 0 otherwise;

EXP_ONLY = 1 if the GAO report indicates that firm *i* only restated expense accounts in year *t*, and 0 otherwise;

LAG_TA = firm *i*'s total assets (#6) at year-end $t-1$;

MNC = 1 if firm *i* is a multinational corporation (i.e., if the absolute value of #273 or #64 is greater than 0) in year *t*, and 0 otherwise;

BLOAT = firm *i*'s extent of balance sheet bloat, measured as shareholders' equity (#216) minus cash and short-term investments (#1), plus total debt (#9 + #34) in year $t-1$, scaled by net sales (#12) at the end of year $t-2$;

LAG_NDTL = firm *i*'s net deferred tax liability (i.e., deferred tax liabilities minus net deferred tax assets) at year-end $t-1$, scaled by total assets at year-end $t-2$;

SC_PT_EM = firm *i*'s year *t* pretax earnings management (originally reported minus restated pretax net income) scaled by total assets at year-end $t-1$;

INV_MILLS = inverse Mills ratio from the first-stage of the Heckman (1979) two-step estimation; and

Σ_j*INDUS* = 1 (0) if firm *i* is (is not) in industry *j* in year *t*, based on three-digit SIC codes.

Variables Used in Equation (7):

RESTATE = 1 if firm *i* appears in the GAO (2002) restatement report and restated its earnings downward (i.e., had income-increasing earnings management) for year *t*, and 0 otherwise;

BT_DIFF = firm *i*'s book-tax differences, which equal book income less taxable income scaled by lagged total assets; book income is pretax income (Compustat #170) in year *t*; taxable income is calculated by grossing-up the sum of current federal tax expense (#63) and current foreign tax expense (#64) and subtracting the change in NOL carryforwards (#52) in year *t*; if current federal tax expense is missing, then total current tax expense is calculated by subtracting deferred taxes (#50), state income taxes (#173) and other income taxes (#211) from total income taxes (#16) in year *t*;

MJAC = firm *i*'s abnormal accruals in year *t* computed using the modified Jones model (Dechow et al; 1995);

MBE = 1 if the firm *i* meets or beats the consensus annual I/B/E/S analyst earnings forecast in year *t*, and 0 otherwise, unless the firm has no analyst following, in which case the dummy variable is 1 if current period earnings are the same as, or higher than, the prior year's earnings (#18);

FIN_R = firm i's external financing raised, equals the sum of additional cash raised from the issuance of common and preferred stock (#108) and the issuance of long-term debt (#111) during year t, scaled by average total assets for year t;

LEV = firm i's leverage ratio, calculated as short term debt (#34) plus long-term debt (#9) at year-end $t-1$, scaled by total assets at year-end $t-1$;

INV_INTCOV = inverse of firm i's interest coverage ratio, calculated as interest expense (Compustat #15) in year t, divided by operating income before depreciation (Compustat #13) in year t;

EPS_G = firm i's earnings per share (EPS) growth, equal to the number of consecutive quarters (up to eight) of growth in EPS going back in time from quarter 4 of the year prior to year t, where $EPS\_Q4_t - EPS\_Q4_{t-1}$ is EPS growth;

STRING = firm i's number of consecutive quarters (up to eight) with positive forecast errors going back in time from quarter 4 of the year prior to year t, where forecast error is actual earnings minus the most recent consensus analyst forecast from I/B/E/S, unless the firm has no analyst following, in which case we consider whether current period earnings are the same as, or higher than, the earnings in the same quarter of the prior year (#18);

CFO = firm i's cash flows from continuing operations (#308 − #124) in year t, scaled by total assets at year-end $t-1$;

ΔCFO = firm i's change in cash flows from continuing operations from year $t-1$ to t, scaled by total assets at year-end $t-1$;

ΔAR = firm i's change in accounts receivable (#2), scaled by total assets at year-end $t-1$;

ΔINV = firm i's change in inventories (#3), scaled by total assets at year-end $t-1$;

ΔCASHSALES = firm i's percentage change in cash sales equals net sales (#12) less change in accounts receivable (#2) for year t minus net sales less change in accounts receivable for year $t-1$, scaled by net sales less change in accounts receivable for year $t-1$;

ΔEARN = firm i's earnings (#18) from year t, scaled by total assets at year-end $t-1$, less earnings in year $t-1$, scaled by total assets at year-end $t-1$;

ABNΔEMPLOYEES = firm i's abnormal change in employees equals the number of employees (#29) for year t minus the number of employees for year $t-1$, scaled by the number of employees for year $t-1$, less total assets (#6) at year-end t minus total assets at year-end $t-1$, scaled by total assets at year-end $t-1$;

OP_LEASES = 1 if firm i's future operating lease obligations (#96, #164, #165, #166, or #167) are greater than 0, and 0 otherwise.

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Do Managers Time Securitization Transactions to Obtain Accounting Benefits?

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ABSTRACT: Relative to recording securitizations as collateralized borrowings, the "gain on sale" treatment has several accounting benefits such as reducing leverage, increasing earnings, and improving efficiency. We investigate whether managers engage in real transaction management to take advantages of these benefits. We predict that in order to maximize financial statement window-dressing, managers will engage in securitizations toward the end of the quarter. We find that 41 percent of the quarter's transactions occur in the third month of the quarter and almost half of these occur in the last five days of the quarter. In addition, we show that when firms report securitization gains sufficient to beat earnings thresholds, the securitization transactions are more likely to have occurred in the last five days of the quarter. We also document that the impact of securitizations on leverage is large and material for many firms. Our results suggest that window-dressing the financial statements appears to be a valuable side-benefit of engaging in securitization transactions.

Keywords: *securitizations; gain on sale; collateralized borrowing; real transaction management; window-dressing; timing; SFAS No. 125; SFAS No. 140.*

Data Availability: *All analyses are based upon publicly available data.*

I. INTRODUCTION

The essential feature of a securitization is that a firm receives cash from outside investors and pays back this obligation with cash flows generated by a specific asset pool, e.g., accounts receivable. Securitizations are a form of financing that has several advantages over traditional bank financing. For example, firms no longer have to wait for customers to pay to obtain cash flows, and they often can obtain these cash flows at lower

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interest rates than required from a traditional bank. Our paper takes as given that there are economic benefits to securitizations. Undoubtedly such transactions would occur regardless of the accounting treatment. The focus of our study is to investigate whether managers *time* their securitizations transactions so as to maximize the accounting benefits.

There are two ways that firms can account for a securitization transaction. The first is to treat the transaction as a collateralized borrowing. The justification for this treatment is that securitizations are a source of financing and so should be reflected in the financial statements as such. Under this treatment the accounts receivables are left on the books until the customers pay, and any cash received from securitizations are recorded as loans. The second way is to treat the transaction as a sale of the accounts receivable. The justification for this treatment is that the firm no longer "owns" the receivables since they have been transferred to a bankruptcy-remote special purpose entity. Under this treatment, the receivables are removed from the books and replaced with cash and a "retained asset." The retained asset represents the firm's ownership stake in the future cash flows. A gain or loss ensures that all accounts balance. Since firms typically report gains, Wall Street terms the sales treatment "gain on sale" accounting.

A comparison of the two treatments reveals that the sales treatment has several accounting benefits: (1) no liability is recorded so leverage is lower; (2) the receivables are removed from the books even though the customers has not paid so efficiency ratios such as days-sales-outstanding are improved and it is easier to hide changes in credit policy; (3) the cash received from securitization is not classified as financing, so operating or investment cash flows (depending on the nature of the receivables) increase; and (4) managers are required to fair-value the future cash flows retained by the firm, but these cash flows are not traded in active markets, so the sales treatment provides flexibility in valuing the retained asset and determining the size of the gain recorded in the income statement. No such ability to manipulate the financial statements is available under the collateralized borrowing treatment.

In this paper we investigate whether managers "time" their securitization transactions toward the end of the quarter. At the end of the quarter, managers know the number they would like to report for receivables and cash in the balance sheet; they know what cash flows they would like to report from operations; and they know what leverage they require to avoid violating covenants or scrutiny from regulators. This "balance sheet management" ability is an advantage of securitizing. For example, a practitioner's guide on securitizations states:

> The loans are often securitized near quarter-end to assure that the on-balance sheet short-term funding can be retired, so as not to violate debt covenants that might exist. (Rosenblatt et al. 2005, 23)

By engaging in the securitization transaction in the last month of the quarter, or the last few days of the quarter, managers with the help of their accountants, investment bankers, and lawyers, can structure the deal to best achieve financial reporting goals.

We investigate whether firms time their securitization transactions using a sample from ABSNET that consists of 11,218 securitization transactions undertaken between 1987 and 2005. This database has the advantage of being large, comprehensive, and covering a long time period. It provides the name of the special purpose entity undertaking the securitization, and the date on which the transaction occurs.

For the ABSNET sample we find significant clustering of securitization transactions at calendar quarter-ends. For the first three quarters, we show that the volume of transactions peak in the third month of the quarter, with up to 48 percent of the transactions occurring in this month. This is significantly greater than the 33 percent that would be expected if the underlying distribution was normal. In addition, we find that over 20 percent of transactions for the *entire quarter* occur in the last five days of the quarter. Almost half of the third month's activity (20 percent/48 percent) occurs within five days of the quarter-end. For the fourth quarter, 39 percent of the activity occurs in December. However, the activity tends to occur earlier in the month, probably because of the Christmas vacation period.

We examine several competing explanations for the clustering. The first is that the clustering is driven by the demand for the underlying asset to which the receivables relate. We compare automobile securitizations to sales of new automobiles, and mortgage securitizations to new home sales. In both cases, we do not find that the underlying assets exhibit the same type of clustering as observed in the securitization markets. In addition, if the clustering were demand driven, then we would expect it to occur in some industries but not in others. However, we find the same type of securitization clustering over a range of different industries and asset classes.

A second explanation could be that firms obtain financing at quarter-ends regardless of the accounting. We examine the timing of 143,568 public debt and 15,560 equity issuances. We do not observe the same type of clustering in either of these distributions, suggesting that financing needs are not fundamentally clustered at quarter-ends.

One disadvantage of the ABSNET sample is that it does not provide information on the ultimate parent company. Therefore, our tests using this database assume that the majority of firms are on a calendar-quarter cycle. A third explanation could be that the clustering is due to some type of seasonality and not accounting quarter-ends. To mitigate this concern we report two results. First, we show that more than 85 percent of firms and 95 percent of financial firms on Compustat have financial year-ends in March, June, September, or December. Therefore, error due to quarter-end dates is likely to be small. Second, we collect a sample that we term the *10-K sample*. This sample links the special purpose entity from ABSNET to the ultimate parent companies. This sample consists of 135 firms engaging in 4,745 transactions for the period 1987 to 2005. We document the same clustering of transactions at quarter-end for the *10-K sample*.

A fourth explanation could be that firms automatically perform securitizations after receivables build up to a given level, and so what we observe is just an orderly system of financing on a month-end basis. We investigate whether there is a difference in quarter-end clustering based on the frequency in which a firm engages in securitizations. If window-dressing is a side benefit, then we expect more quarter-end clustering for infrequent securitizers. Infrequent securitizers only engage in securitizations once or twice a year. They are unlikely to systematically or smoothly build up receivables. Therefore, management have more discretion over the timing relative to frequent securitizers that build up receivables continually and engage in securitizations on a regular basis. Consistent with window-dressing, we find that infrequent securitizers are more likely than frequent securitizers to engage in securitization in the last month of the quarter. For example, in the first quarter we find that over 50 percent of transactions for infrequent securitizers occur in the third month, versus 44 percent for frequent securitizers. In addition, we show that even frequent securitizer engage in more securitizations in the last five days of the third month of the quarter, relative to the last five days of the second or first month.

Our next test attempts to directly link the timing of securitizations and incentives to manipulate the financial statements. For 195 firm-years in our *10-K sample*, we collect the income statement effects of securitizations from footnotes. Firms can report a gain, loss, or zero effect from securitizations. Prior research suggests that there are several earnings benchmarks that are important psychological threshold for management (Burgstahler and

Dichev 1997; Schrand and Walther 2000; Degeorge et al. 1999). Graham et al. (2005, 2006) survey over 400 senior financial executive and find that managers are willing to sacrifice economic value to meet earnings objectives. They document that reporting a profit is viewed as the most important benchmark for 65.2 percent of respondents. They also find that beating earnings in the same quarter of the last year is viewed as important by many respondents.

We document that 51 firms report negative earnings before undertaking the securitization, and of these, 35 firms (69 percent) report gains sufficiently large so as to move the firm from reporting negative earnings to a profit. In contrast, we find that for 144 firms reporting a profit before undertaking the securitization, only one firm (0.7 percent) reports a loss sufficiently large so as to move the firm from reporting a profit to negative earnings. All remaining firms that report a loss from securitization (11 firms) were profitable both before and after the securitization. These results are consistent with securitization gains being more likely to move firms over the positive earnings threshold then a securitization loss is to move firms below the threshold.

We then investigate the timing of the securitization transactions. We document that of the 35 firms that report a securitization gain of sufficient size to move the firm from reporting a loss to a profit, 36 percent of transactions occur in the last five days of the quarter. In contrast, of the 144 firms that are already reporting a profit, only 15 percent engage in securitizations in the last five days of the quarter. We obtain similar results for our tests examining the threshold of beating last year's earnings. These results directly link a motivation to engage in earnings management with a greater prevalence of quarter-end clustering and are consistent with our window-dressing explanation.

We also examine the impact of securitizations on the balance sheet. We collect footnote disclosures that help us back out the "sales treatment" and convert the securitizations to collateralized borrowings (see Landsman et al. 2008). We show that treating securitizations as borrowings results in leverage ratios increasing by on average 41 percent. This suggests that the impact of securitizations on the balance sheet is nontrivial and further supports our story that the clustering we observe at quarter-end is in part performed to clean up the balance sheet.

Our results provide evidence in support of a concern raised by Ryan (2002, 189) that securitizers can increase or decrease earnings by timing securitizations. In addition, since firms are not required to make quarterly disclosures, and since SFAS No. 140 falls short of enabling investors to back-out the "sales treatment," this window-dressing tool is likely to be quite effective at masking the "true" underlying economics of the firm. As a consequence our results suggest that reporting reliability is reduced for firms engaging in securitizations and supports Niu and Richardson (2006) who show that securitization gains are perceived by investors as less reliable than other components of earnings. Finally, our results provide evidence in support of Karaoglu (2005) and Dechow et al. (2008) that show managers use the accounting flexibility offered under SFAS No. 125/140 to manage earnings and regulatory capital.

The next section discusses the securitization process and provides a simple example to highlight the accounting benefits of the "gain on sale" accounting treatment offered in SFAS No. 125/140. Section III provides our evidence on timing of securitizations. Section IV presents results concerning earnings management incentives and clustering of transactions toward the end of the quarter. Section V provides collaborative evidence of the impact on leverage from putting securitized receivables back on the balance sheet (i.e., treating them as collateralized borrowings). Section VI provides our conclusions.

II. THE SECURITIZATION TRANSACTION

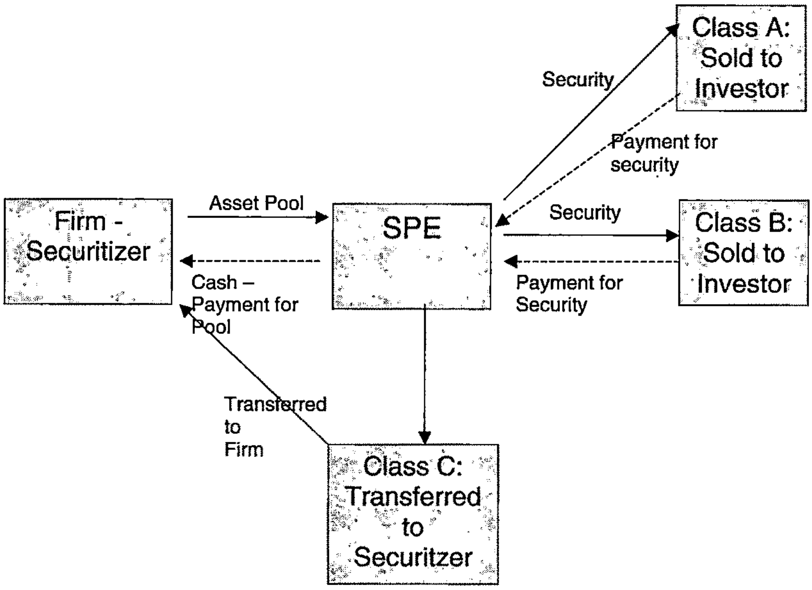
The Accounting Problem

Exhibit 1 presents a typical securitization transaction. A firm (the securitizer) transfers assets (the receivables) to a special purpose entity (SPE). This SPE determines with the help of a rating agency, the proportion of the receivables' cash flows that can be sold (typically in tranches) to get the desired credit rating. Managers also decide how to structure the payoffs. For example, some tranches could be interest-only tranches, while others could be principal-only. The buyers of these securities are pension funds, hedge funds, or banks. In order to obtain the desired ratings, the firm is typically required to retain some proportion of the cash flows. This portion is transferred back to the firm from the SPE. The tranche retained by the firm contains more credit risk and prepayment risk than the tranches sold to investors. This is why Wall Street terms the retained cash flows "toxic waste." For many securitizations, the "toxic waste" is not sold to another party so there is no market value for this tranche.

The interesting accounting issue with respect to securitizations is when should these transactions be treated as collateralized borrowing and when should they be treated as sales? When a firm retains the risk of ownership of the receivables (i.e., prepayment risk, default risk) are they really sold? Are the investors in the securitizations merely providing financing to the firm that is low risk because it is collateralized by the cash flows generated from the receivables? After much deliberation, the Financial Accounting Standards Board (FASB) released SFAS No. 125 in 1996 (FASB 1996). Adopting a fair-value, balance sheet perspective, SFAS No. 125 specified the rules for treating securitizations as sales. The technical specifics are that in order for a sale to have occurred, the investors in the tranches must

EXHIBIT 1

A "Typical" Asset-Backed Securities Issue



not be able to break through the SPE veil and have recourse to the firm to cover losses that they may incur. Thus, obtaining sales treatment requires meeting specific legal rules, and is a lucrative business for lawyers, investment bankers, and accounting firms.

In 2000, the FASB released SFAS No. 140 (FASB 2000). This standard did not change the accounting but requires firms to separately disclose details about the securitization including the gain. SFAS No. 140 does not require quarterly disclosures, and it falls short of making it easy for users to accurately reverse out the sales treatment on the balance sheet.[1] There is however, demand for such information. Moody's and the Federal Reserve Board, who can request additional private information from firms, both state that they generally back-out the "gain on sale" treatment and collateralize the loans when assessing the economic risk of the firm.[2]

Comparison of Financial Statements under "Gain on Sale" versus Collateralized Borrowing

Exhibit 2 provides a simple example to clarify the accounting benefits of obtaining "gain on sale" accounting.

Assume a firm starts with $600 inventory, $100 cash, and equity of $700. It sells the entire inventory and records sales and receivables (net of allowances) of $1,000. It then immediately transfers all the receivables to a special purpose entity (i.e., there is no difference between the net book value and the market value of the receivables). Assume that the SPE then sells 90 percent of the cash flows relating to the receivables for $900 cash to outside investors, and the firm retains the residual ten percent. As the customers make their payments to the firm, they are used to pay back investors. We ignore the impact of servicing in this example. As a result of this securitization transaction the firm has $900 cash.

SFAS No. 125/140 requires the firm to record the transaction as a sale when the firm relinquishes control over the assets (transfers the assets to an SPE that meets the legal requirements of being bankruptcy remote). In other words, the rules do not require consolidation of ownership interest.[3]

Treating the transaction as a sale will result in the following verifiable entries:

DR	Cash		900	
	CR	Receivables		1000

The accounting question is how to record the firms holding in the remaining 10 percent of the cash flows. SFAS No. 125/140 stipulates that the firm's retained interest in the sold receivables be recorded at fair-value. However, the standard does not explicitly state how fair-value is determined. A reading of Concept Statement No. 7 indicates that when "management's estimates are the only available information" the objective is "to estimate the price likely to exist in the marketplace, if there were a marketplace" (SFAC No. 7, highlights). Since nothing has happened to alter the receivable cash flow streams, this would suggest that the price of the entire stream of cash flows should be equivalent to the carrying value of the receivables on the firm's books. This view is expressed by the academics on the American Accounting Association Financial Accounting Standards Committee (AAA FASC 1996, 180) in their comment letter on the accounting for securitizations:

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[1] Landsman et al. (2008) use an approximation to reverse the effects of gain on sale accounting in order to consolidate the securitization transactions. However, their method estimates the liability since the true liability is not disclosed and the accuracy of the measure will vary depending on the nature of the securitizations. Their method is similar to that used by Moody's Investor Services.

[2] Based on presentations by representatives of the Federal Reserve Board and Moody's at the AAA/FASB Financial Reporting Issue Conference, December 2005. Both the Federal Reserve Board and Moody's can and do demand additional private information from firms to help them reverse out the sales treatment.

[3] Based on our discussions with securitizations professionals, it can be difficult to structure a transaction as a collateralized borrowing since the typical structures used are designed to achieve gain on sale accounting.

EXHIBIT 2

Comparison of Two Alternate Accounting Treatments for Securitization Transactions: Collateralized Borrowing Versus Gain on Sale Accounting

Opening Balance Sheet	**$**
Cash	100
Accounts Receivable	0
Inventory	600
Total Assets	700
Equity	700
Total Liability and Equity	700

Firm sells all inventory on credit for $1,000 and securitizes the accounts receivable receiving $900 in cash from the SPE. The retained interest has a fair value of $110.

Closing Balance Sheet **Collateralized Borrowing**	**$**	**Gain on Sale**	**$**
Cash	1,000	Cash	1,000
Accounts Receivable	1,000	Accounts Receivable	0
Inventory	0	Inventory	0
		Retained Interest	110
Total Assets	2,000	Total Assets	1,110
Liability	900	Liability	0
Equity	1,100	Equity	1,110
Total Liability and Equity	2,000	Total Liability and Equity	1,110

Income Statement **Collateralized Borrowing**	**$**	**Gain on Sale**	**$**
Revenue	1,000	Revenue	1,000
Cost of Goods Sold	600	Cost of Goods Sold	600
		Gain on Sale	10
Net Income	400	Net Income	410

Statement of Cash Flows **Collateralized Borrowing**	**$**	**Gain on Sale**	**$**
Cash from Operations	0	Cash from Operations	900
Cash from Investing	0	Cash from Investing	0
Cash from Financing	900	Cash from Financing	0
Change in Cash	900	Change in Cash	900

(*continued on next page*)

EXHIBIT 2 (continued)

Ratio Analysis	Collateralized Borrowing	Gain on Sale	Improvement in Ratio from Gain on Sale
Efficiency			
Days Receivable Outstanding	365 days	0 days	√
Profitability			
Return on Assets	20%	37%	√
Profit Margin	40%	41%	√
Liquidity			
Free Cash Flows (CFO+CFI) to Assets	0%	81%	√
Leverage			
Debt to Assets	45%	0%	√

> unless a fundamental attribute of the underlying asset has changed, the fair value of the items exchanged should be equal to their carrying amounts, implying *no gain* at transfer. (emphasis added)

In other words since the retained interest is not actively traded in markets, the most verifiable fair-value is the carrying value of the original receivables. The retained interest should be valued as the difference between the cash received and the original price of the receivables (i.e., $100). A value of retained interest above 100 and the recording of a gain indicate that managers are using lower discount rates than implied by the carrying value of the original receivables, likewise, losses indicate higher discount rates.

We view the reporting of a securitization loss or gains as the outcome of managerial discretion, because they imply managers are valuing the unverifiable retained interest using discount rates other than implied by the carrying value of the receivables.[4] For the purpose of the example, we assume that managers report the following:[5]

DR	Retained Interest		110	
	CR	Gain		10

The alternative accounting treatment is to treat the securitization as a collateralized borrowing:

DR	Cash		900	
	CR	Liability		900

Exhibit 2 compares the balance sheet, income statement, and statement of cash flows under the two treatments. We also provide a comparison of common ratios used by investors and creditors. This comparison shows the accounting benefits of securitizations. The "gain on sale" firm appears to be *more efficient* at collecting receivables since the receivables have disappeared (even though the firm has retained the credit risk). Investors no longer can examine whether collection has slowed or credit policies have changed. The "gain on sale" firm appears *more profitable* (return on assets increase from 20 percent to 37 percent). The gain (often not disclosed) increases profits, while total assets are smaller. The "gain on sale" firm can classify cash flows from securitizations either as operating activities or investing activities depending on the nature of the underlying asset, under either definition *reported free cash flows improves*. Finally, the "gain on sale" firm appears to have *lower leverage*. All obligations are off-balance sheet. Therefore, the firm classifying the securitization as a sale can appear more liquid, less risky, more profitable, and have stronger free cash flows relative to a firm that classifies the transaction as a collateralized borrowing.

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[4] Firms may have less discretion in terms of recording losses from securitizations. However, before entering the transaction managers know whether they will report a loss and hence our sample consists of the subset of firms that chose to enter the transaction despite reporting a loss.

[5] Dechow et al. (2008) provide more details on the discretion in valuing the retained interest.

III. RESULTS

Balance Sheet Window-Dressing and Timing of Securitizations

We hand-collect 11,218 individual securitization transactions for eight different major asset classes from http://www.absnet.net provided by Lewtan Technologies for the period 1987 through 2005.[6] We define major asset class as any asset class that has 250 or more transactions during the period. We refer to this sample as the *ABSNET sample*. The database provides details on individual securitization transactions including the date of the transaction, the amount securitized, the tranche structure, the SPE, the asset type, and the seller's name. We collect the transaction date, asset type, the seller's name, and the amount securitized, when available.

Figure 1 Panel A presents the distribution of the transactions by month. What is observable in Figure 1 is that a greater proportion of transactions occur in months 3, 6, 9, and 12. These represent March, June, September, and December, which are typically fiscal quarter-ends. We also examine the total dollar value of securitizations by month (instead of total transactions). The distribution (not reported) is almost identical to Figure 1. Panel B reports the distribution of transaction by day of the month. September, April, June, and November have 30 days, while remaining months (except, of course, February) have 31 days. In this figure we use the classification "last day" to indicate the last day of the month (whether it is 30 or 31). Clearly, the last day of the month is very different from the first day of the month. Panel C presents the transaction data by day of the year. The largest securitization transaction days of the year are March 30/31, June 29/30, and September 29/30. December 30/31 does not exhibit such strong clustering. There are several explanations for this. First, anticipation of the holiday season (December 25 to January 1) could spur firms to engage in securitizations earlier in the month. Consistent with vacations playing a role, December has proportionally more transactions occurring between days 16 to 24 than other months. Second, auditors may view transactions occurring on the last day of

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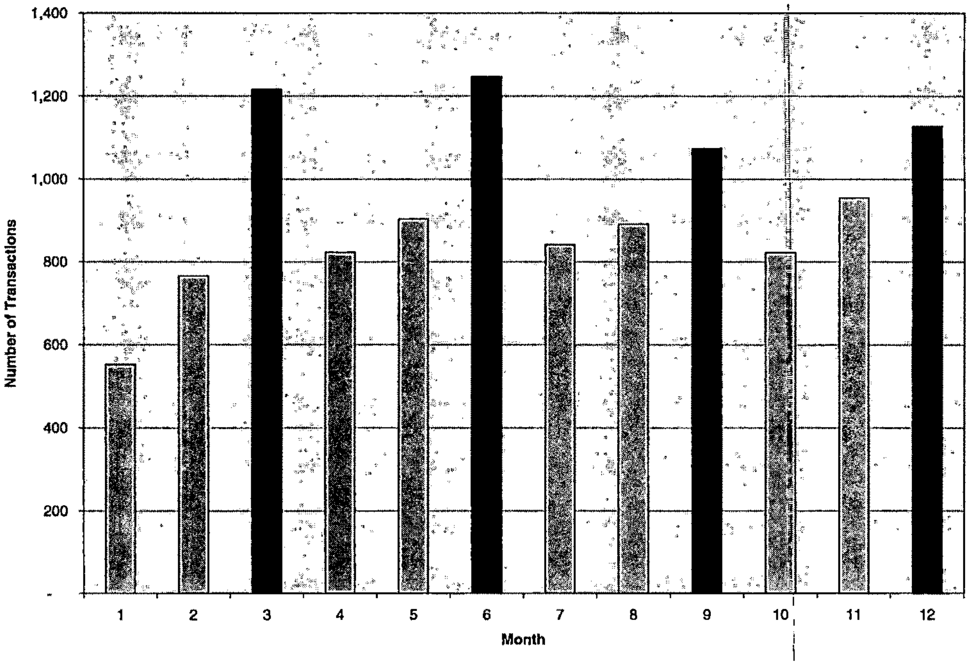
[6] ABSNET requires the following explanation to be disclosed when the data from the website is downloaded and used: "The information and data contained on this screen is derived from sources considered reliable, but Lewtan and its suppliers do not guarantee its correctness or completeness. The user is solely responsible for the accuracy and adequacy of any information used by it and the resultant output thereof, and Lewtan and its suppliers disclaim any and all liability therefore. Some information contained in ABSNet(tm) is also copyrighted (© 1998–2000) by Standard & Poor's, a division of The McGraw-Hill Companies, Inc. While this information is based on sources considered reliable, neither Standard & Poor's nor its affiliates guarantees the accuracy, adequacy, or completeness of the information and they are not responsible for errors, omissions re results obtained from use of the information. Standard & Poor's receives compensation for ratings. Such compensation is based on the time and effort to determine the rating and is normally paid either by the issuers of securities or by the underwriters participating in the distribution thereof. The fees generally vary from $2,500 to $100,000. While Standard & Poor's reserves the right to disseminate the rating, it receives no payment for doing so, except for subscriptions to its publications."

FIGURE 1
Transactions by Calendar Time for ABSNET Sample

Panel A: Securitization Transactions by Month



Panel B: Securitization Transactions by Day

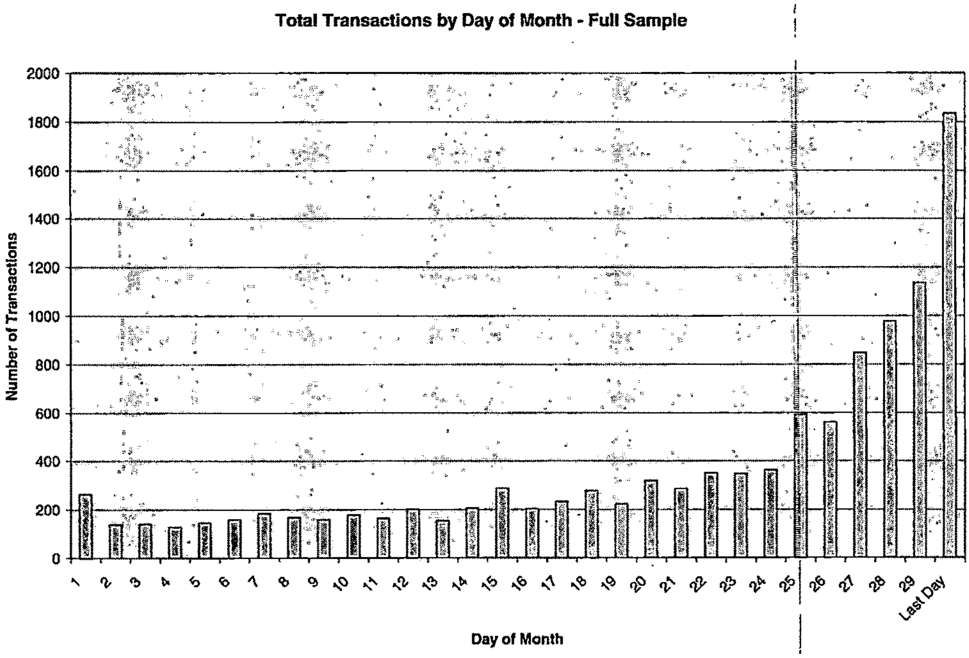


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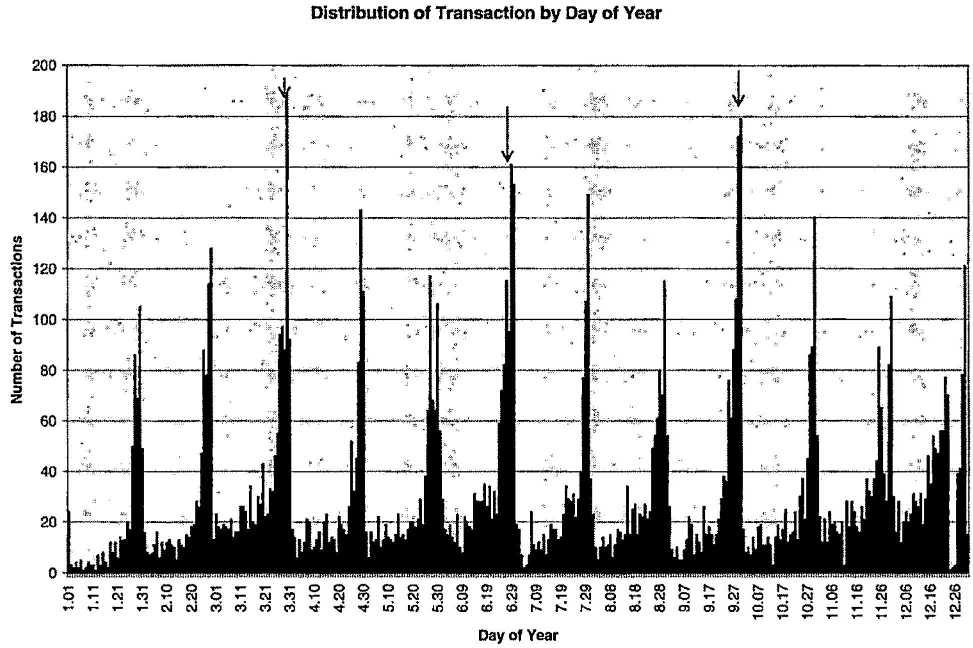
FIGURE 1 (continued)

Panel C: Securitization Transactions by Day of Calendar Year



The figures are based on 11,218 individual securitization transactions collected from the ABSNET.net for the period 1987 through 2005. In Panel B last day of the month equals day 30 plus day 31 of the month.

the year with particular scrutiny, so by timing the transaction slightly earlier the firm avoids this obvious red flag.

Table 1 cumulates the data across time and reports the number of transactions occurring in each month as a percent of the total transactions occurring in the quarter (columns (2) and (3)). An analysis across the quarters indicates that in the first quarter 48 percent, in the second quarter 42 percent, in the third quarter 38 percent, and in the fourth quarter 39 percent of transactions occur in the third month of the quarter. A Chi-square test indicates that these proportions are significantly different from a uniform distribution across months within a year. Column (4) provides the number of transactions that occur in the last five days of the month. Column (5) provides the transactions that occur in the last five days as a percentage of the total transactions that occur in the quarter. For the first quarter, 22 percent, for the second quarter 20 percent, and for the third quarter 19 percent of transactions occur on the last five days of the quarter. The Chi-square test indicates that the distribution of the 12 five-day periods is significantly different from a uniform distribution. In the fourth quarter only 10 percent of transactions occur in the last five days of the year. December 31 is typically a vacation day and so this may explain the low volume. However, the volume of transactions is still higher than 5.5 percent (5/90), the amount expected were transactions to occur evenly throughout the quarter.

TABLE 1
Distribution of Transactions by Month

(1) Month of Quarter	(2) Transactions	(3) % of Quarter	(4) Last 5 Days of Month	(5) % of Quarter
Quarter 1				
1	552	21.78%	359	14.17%
2	766	30.23%	455	17.96%
3	1,216	47.99%	560	22.10%
Total	2,534			
Quarter 2				
1	823	27.68%	414	13.93%
2	903	30.37%	411	13.82%
3	1,247	41.94%	606	20.38%
Total	2,973			
Quarter 3				
1	841	29.96%	410	14.61%
2	892	31.78%	380	13.54%
3	1,074	38.26%	547	19.49%
Total	2,807			
Quarter 4				
1	822	28.31%	414	14.26%
2	955	32.89%	323	11.12%
3	1,127	38.81%	294	10.12%
Total	2,904			
Total Obs.	11,218		5,173	
Chi-Square Test		476.19[a]		234.14[b]
p-value		<0.0001		<0.0001

Number of transaction by calendar month and in the last five days of the month for 11,218 securitization transactions from 1987 to 2005 obtained from ABSNET.

[a] Chi-square tests of the null hypothesis that the underlying distribution of transactions across the 12 months follow a uniform distribution.

[b] Chi-square test of the null hypothesis that the sum of the transactions occurring in the last five days of the month are uniformly distributed across the 12 months.

Alternative Explanations and the Quarter-End Clustering

The findings reported in Figure 1 and Table 1 are consistent with firms timing securitization transactions to take advantage of the accounting benefits. We next examine competing explanations for the clustering.

Demand for the Underlying Assets

One possible explanation is that the clustering is driven by the underlying demand for specific assets being securitized. For example, perhaps people prefer to obtain mortgages at the end of the month. In Table 2 we separate observations into various asset classes. If the clustering is driven by demand for certain types of underlying assets, then we would expect some asset classes to exhibit clustering while others would not. The results indicate that *all* asset classes exhibit a third month of the quarter clustering. The underlying customers for the securitized assets could be buying cars, obtaining mortgages, leasing equipment, or buying manufactured homes. We can see no obvious reason why their consumption

TABLE 2
Transactions by Month for Each Major Asset Class

Asset Class	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Chi-Square
Manufactured Housing	19	18	33	12	20	32	13	18	33	12	21	25	256	31.53
Equipment Leases	4	6	31	12	30	35	16	16	39	19	28	35	271	69.30
CDO	27	24	67	56	56	70	59	57	44	56	67	117	700	104.79
Commercial Mortgaged Backed Securities	20	78	98	74	71	90	93	72	52	68	82	129	927	98.64
Automobile Loans	36	50	87	50	61	108	65	67	71	65	70	79	809	56.82
Credit Card	49	51	95	67	73	116	67	97	76	77	105	68	941	60.74
Home Equity	223	290	381	298	323	364	317	275	349	291	329	339	3,535	56.82
Mortgaged Backed Securities	174	249	424	254	269	432	211	290	410	234	253	335	3,779	278.06
Total	552	766	1,216	823	903	1,247	841	892	1,074	822	955	1,127	11,218	476.19

Number of transaction by calendar month for each major asset class for ABSNET sample for 11,218 securitization transactions from 1987 to 2005. Major Asset Class is defined as an asset class with more than 250 transactions during the period. The Chi-square tests test the null hypothesis that the underlying distribution of the transactions follows a uniform distribution. Chi-square test is significant at 0.01 level when it exceeds 24.725.

habits would be correlated across these activities and exhibit third month of the quarter clustering in demand. The fact that we observe the clustering across all asset classes suggests that underlying demand is unlikely to be a complete explanation for the clustering we observe.

To further examine this explanation we obtain macroeconomic distributions of two of the underlying assets that are securitized. The coverage in the ABSNET database prior to 1990 is sparse since securitizations were infrequent. Therefore, we collect macro-level variables for the period 1990 though 2005 when available.

Figure 2 compares monthly automobile securitizations (Panel A) to automobile sales (Panel B). We obtain monthly automobile unit sales from the Bureau of Economic Analysis for the period 1990 through 2005. The data on automobile sales is based on sales from the auto companies to dealers, and it is possible that the auto companies could force acceptance of vehicles toward the end of the quarter. However, the distribution of auto sales is relatively smooth, peaking in June. It does not show the saw-tooth pattern exhibited in the securitization market.

Figure 3 compares mortgage-backed securitizations (MBS) to new house sales. We obtain monthly new house sales from the U.S. Census Bureau for the period 1990 to 2005. This is not the perfect comparison since we should compare MBS transactions to mortgage originations.[7] However, the comparison does give some idea of demand for underlying homes since financing is required at the time of the home sale. Housing sales appear to peak in March. Again, the distributions appear to be quite different.

Demand for Financing

Another explanation is that the demand for financing by firms is clustered. For example, perhaps firms always require cash at the end of the quarter; and this demand, rather than window-dressing, explains our findings. To investigate the validity of this explanation we analyze the issuances of debt and equity. If there is a general demand for liquidity at the end of quarters, then we would expect to see this same demand in debt and equity markets. Note that from an accounting perspective the incentives to issue debt or equity differ from that of securitizations. When a firm issues debt, this increases leverage; so, if anything, firms may prefer to avoid issuing debt on the last day of the quarter. It is unclear what incentives firms face issuing equity. We obtain data on U.S. equity and public debt issues identified by Securities Data Corporation (SDC) from January 1, 1990 to December 31, 2005. In a number of cases firms issued more than one type of security on a particular day. We treat each observation as a separate transaction. Results are very similar when we exclude multiple transactions occurring on the same day.

Figure 4 provides the distribution of 143,568 debt issuances by (1) month, (2) day of the month, and (3) day of the year. March appears to be a peak time to issue debt. However, June, September, and December show no obvious clustering. The distribution of transactions by day of the month indicates that demand for debt appears to peak in the middle of the month and not at the end. Finally, the distribution by day of the year does not exhibit the same peak-like pattern observed in Figure 1.

Figure 5 provides a similar breakdown for 15,560 issuances of equity. Here, the peak month for issuing equity is June. However, there is no obvious clustering in March, September, or December. Figure 5, Panel B provides the breakdown of transactions by day of the month. Similar to debt issuances, demand for equity appears to peak in the middle of

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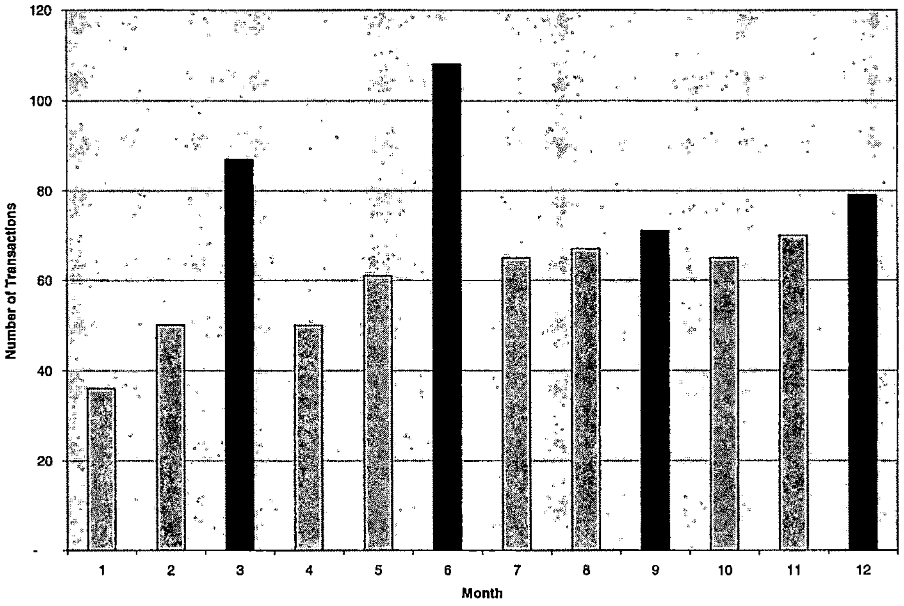
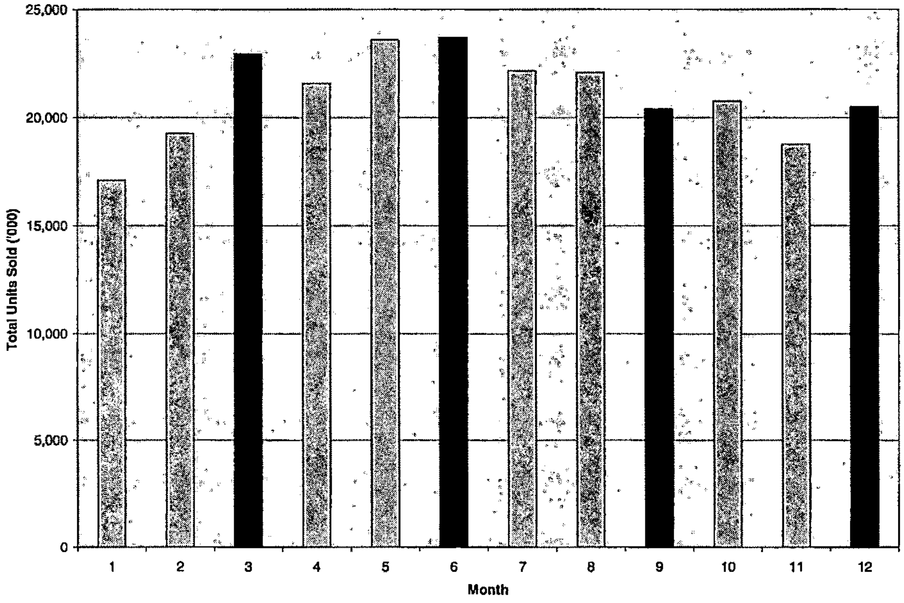
[7] Mortgage origination statistics are only available on a quarterly basis and are issued by the Department of Housing and Urban Development (HUD).

FIGURE 2
Automobiles—ABSNET Sample

Panel A: Automobile Securitization Transactions by Month



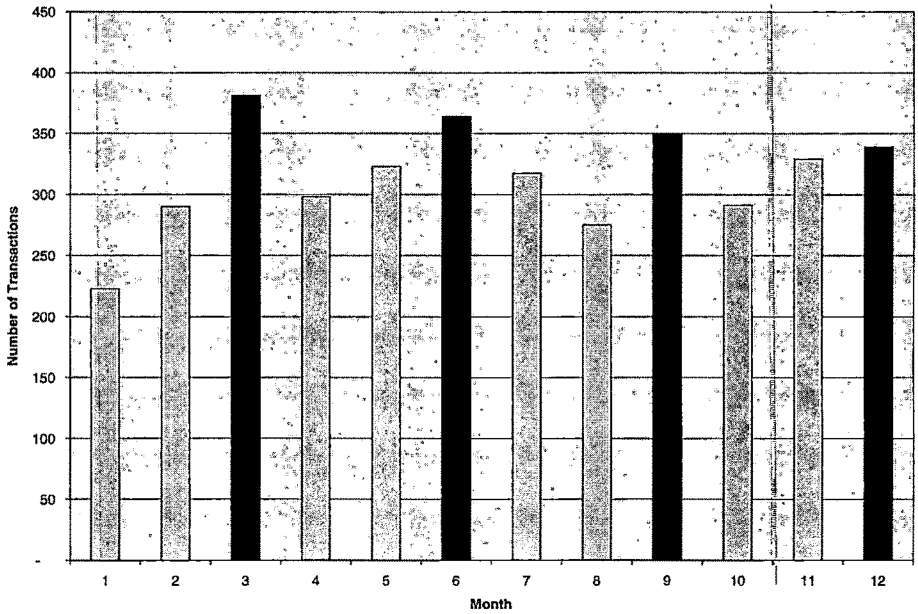
Panel B: Automobile Unit Sales by Month



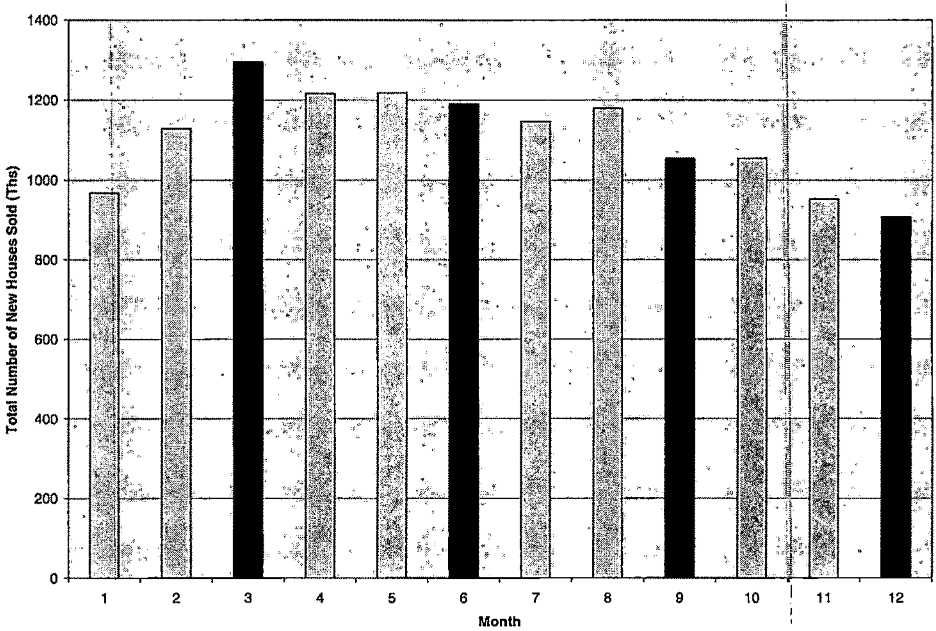
Panel A represents individual automobile loan securitization transactions collected from the ABSNET.net for the period 1987 through 2005. Panel B is the automobile unit sales collected from the Bureau of Economic Analysis.

FIGURE 3
Mortgages—ABSNET Sample

Panel A: Residential MBS Transactions by Month



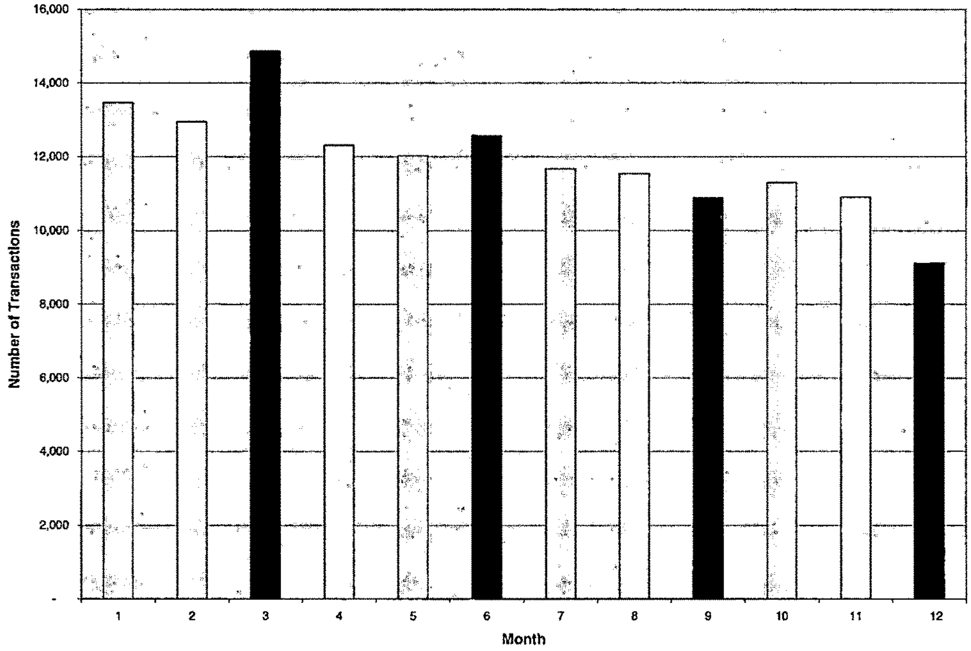
Panel B: New House Sales by Month



Panel A represents individual residential mortgage securitization transactions collected from the ABSNET.net for the period 1987 through 2005. Panel B is new house sales by month collected from U.S. Census Bureau.

FIGURE 4
Distribution of Public Debt Issues

Panel A: Public Debt Issues by Month



Panel B: Public Debt Issues by Day of Month

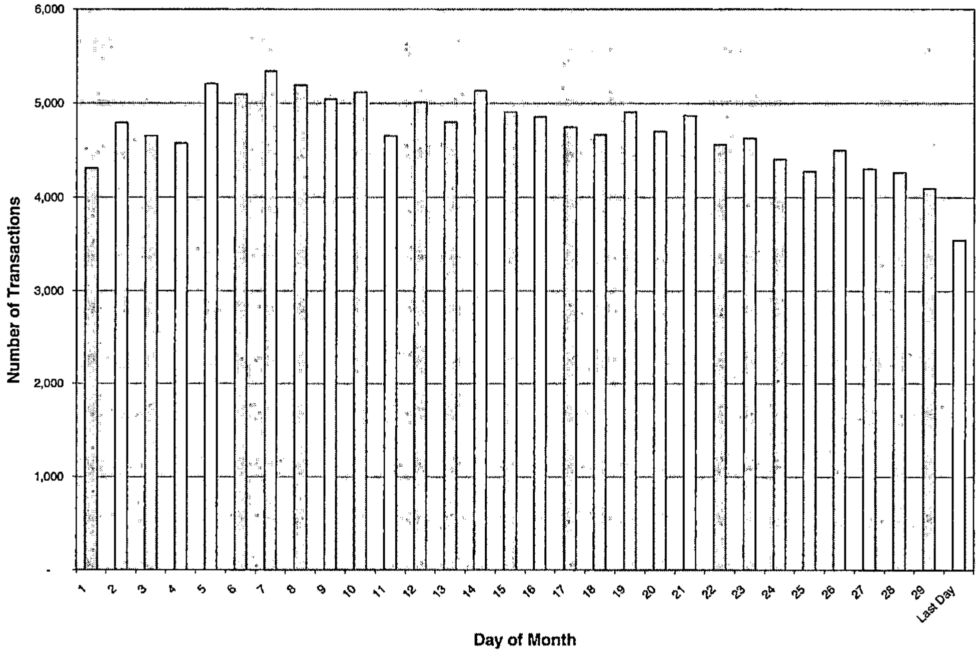


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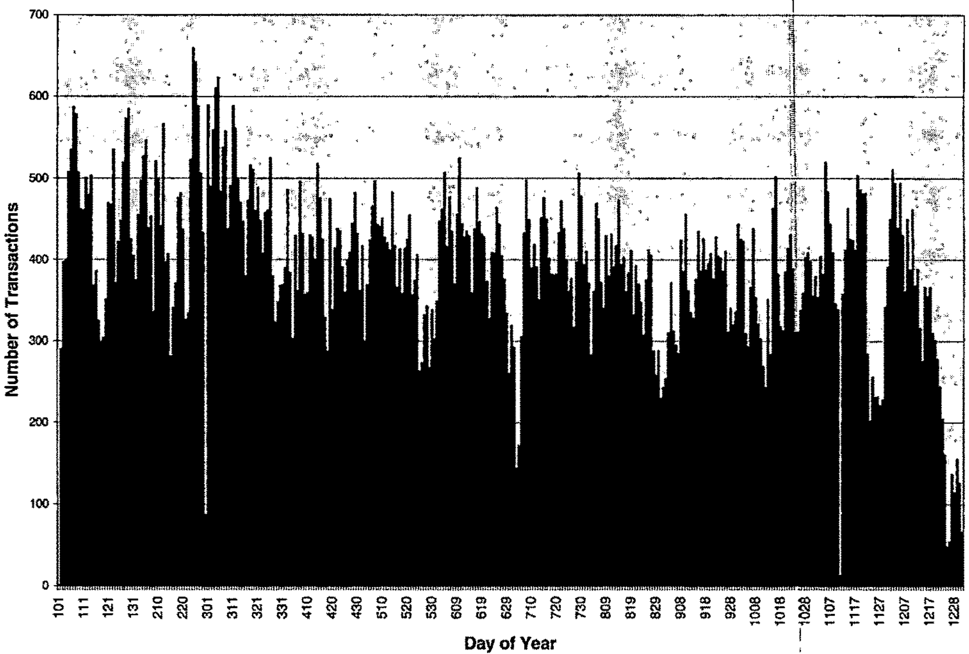
FIGURE 4 (continued)

Panel C: Public Debt Issues by Day of Year



The figures are based on 143,568 individual public debt issues collected from the Securities Database Corporation (SDC) Platinum for the period 1990 through 2005. In Panel B last day of the month equals day 30 plus day 31 of the month.

the month, not at the end. Figure 5, Panel C provides the breakdown by day of the year. Interestingly, both the debt and equity markets show a much greater drop-off in activity in the last few days of December than the securitization market. Again, no obvious clustering in the last few days of the quarter is observable in the equity markets.

In summary, when firms issue debt or equity, they do not appear to cluster these transactions at the end of the month or more greatly in the third month of the quarter. This suggests that demand for financing is unlikely to explain the clustering we observe in the securitization market.

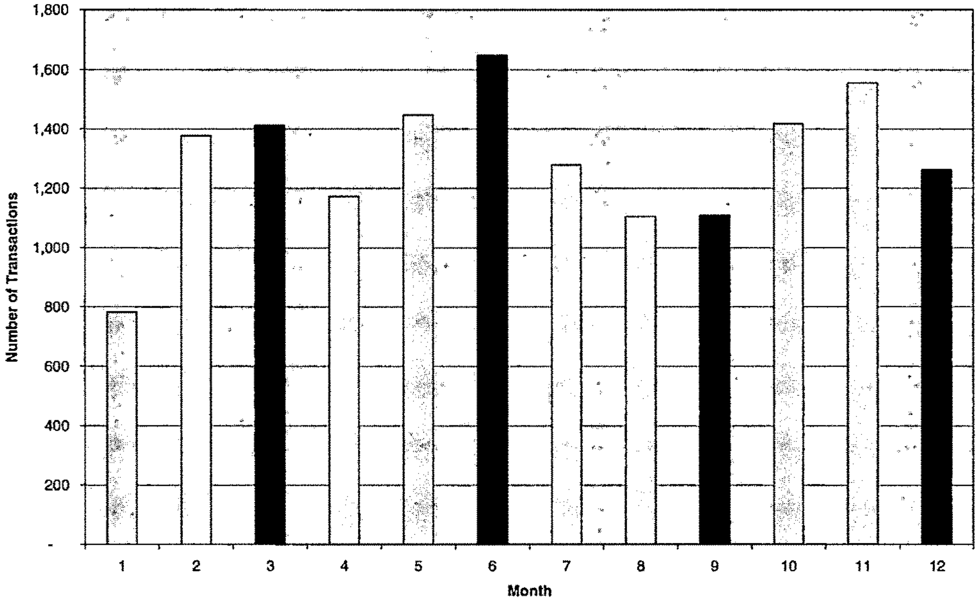
Calendar Quarter versus Fiscal Quarter

One limitation of the ABSNET sample is that we do not know the fiscal year-end of the ultimate parent company undertaking the transactions. Therefore, one criticism of our results is that we could be observing some type of (unknown) seasonality effect rather than financial statement window-dressing. We provide two tests to alleviate this concern. The first test examines the fiscal year-ends of all firms on Compustat. This test provides indirect evidence on the likely fiscal year-ends of parent companies. The second test examines a subset of securitizations where we know the parent fiscal year-end.

Table 3 provides information on fiscal year-ends for all firm-years reporting assets on Compustat between 1990 and 2005. The results indicate that 65 percent of firms have December year-ends. In addition, firms with a March, June, or September fiscal year-end

FIGURE 5
Distribution of Equity Issues

Panel A: Equity Issues by Month



Panel B: Equity Issues by Day of Month

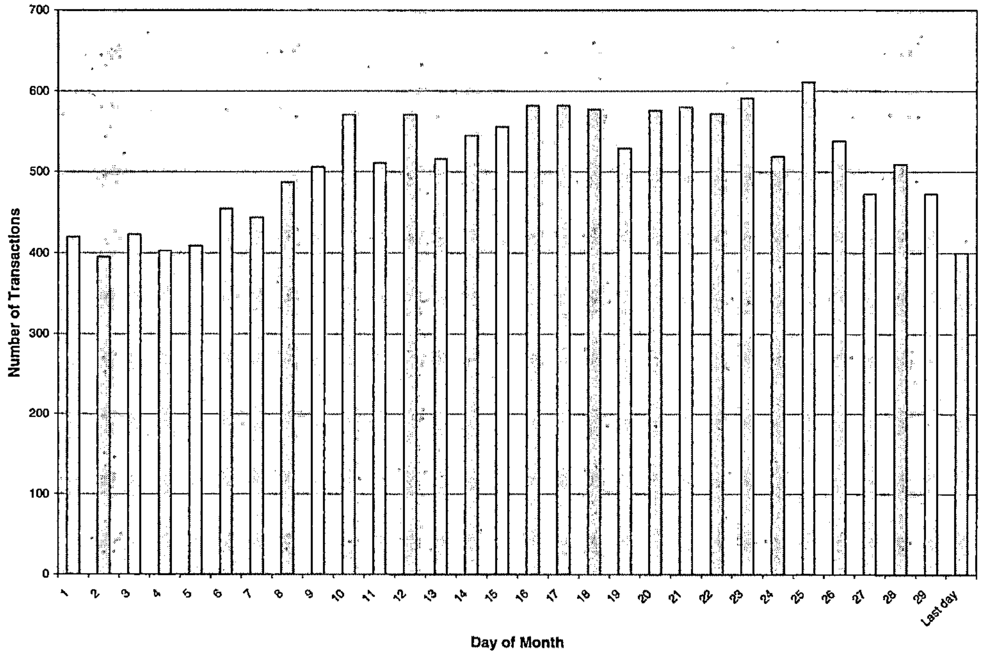


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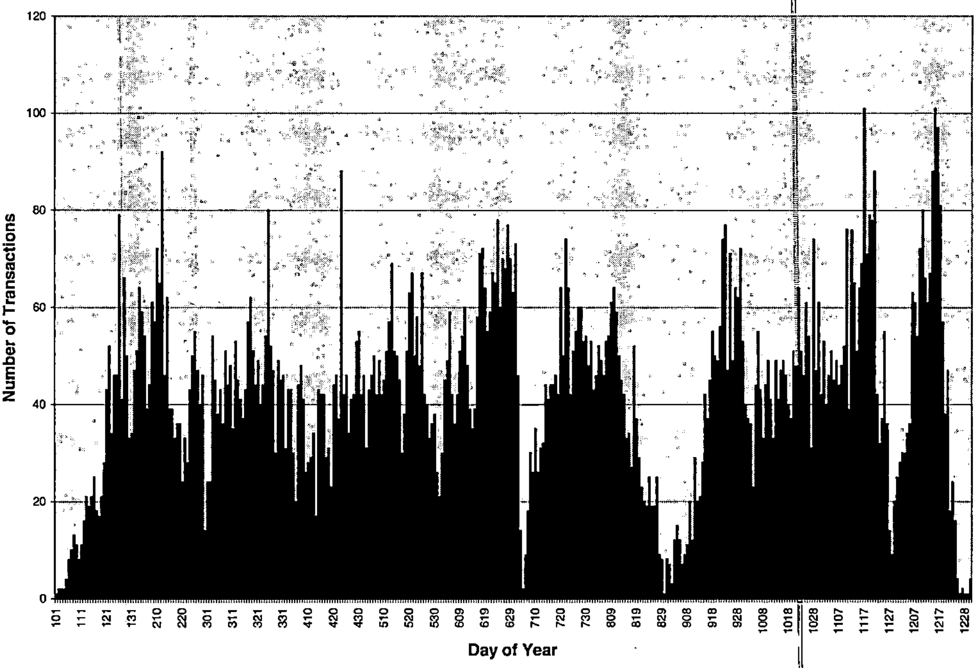
FIGURE 5 (continued)

Panel C: Equity Issues by Day of Year



The figures are based on 15,560 individual equity issues collected from the Securities Database Corporation (SDC) Platinum for the period 1990 through 2005. In Panel B last day of the month equals day 30 plus day 31 of the month.

also face similar incentives to a December fiscal year-end firm to window-dress their quarterly financial statements. The proportion of firms with March, June, September, and December year-ends is 85.72 percent. In the third column we separate financial firms since they predominantly engage in securitization transactions and are likely to be overrepresented in the ABSNET sample. For financial firms, 81 percent have December fiscal year-ends, and 95 percent have March, June, and September, and December fiscal year-ends. Error from misclassifying fiscal year-ends is unlikely to be a major concern.

Our second test links the ABSNET sample to parent companies. This is a nontrivial exercise because the seller in the ABSNET database, when it is disclosed, is typically a subsidiary.[8] Some sellers have names that are easily identifiable with the parent company (e.g., Ford Motor Credit Corp is the financing subsidiary of Ford). However, many sellers have names that are not so obvious (e.g., WMC Mortgage Corp is a subsidiary of General Electric). In addition, the sellers' names are not always reported nor are the full legal names

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[8] ABSNET reports significant detail about the transaction structures. However, it was not possible to link most of this detail to the financial statements. For example, though the structure of the various tranches is typically disclosed, it is not possible to identify which tranches the seller may have bought back. In addition, the database discloses the current coupon rate for each security. It is not possible to link this coupon rate to the discount rate disclosed in the financial statements. The coupon rate may not reflect the underlying market risk since the security may have been issued at a discount or a premium. Or even more perversely, for some classes of securities referred to as Inverse Rate Floaters, the coupon rate may even move in the opposite direction to interest rates.

TABLE 3
Distribution of Fiscal Year-Ends

Financial Year-End	**All n = 150,013 Percent**	**Financial n = 27,097 Percent**	**Nonfinancial n = 122,916 Percent**
1	3.20	0.69	3.74
2	1.39	0.38	1.62
3	5.78	2.88	6.42
4	1.66	0.72	1.87
5	1.64	0.66	1.86
6	8.09	5.99	8.55
7	1.64	0.66	1.86
8	1.49	0.24	1.77
9	6.59	5.10	6.92
10	2.10	0.81	2.38
11	1.16	0.69	1.26
12	65.26	81.18	61.75
Total	100.00	100.00	100.00
Financial Year-End: 3, 6, 9, or 12	85.72	95.15	83.64

The distribution of fiscal year-ends for all firm-years with assets on Compustat between 1990 and 2005. "Financial" are firms with SIC codes between 6000 and 6999.

of the subsidiaries always disclosed. For example, no sellers were disclosed for Collateralized Debt Obligations (CDO) securitizations. To link the companies we searched 10-K filings, Hoovers online, and used the http://www.google.com search engine for the seller's name. Through these searches we were able to link 4,745 transactions (or 42 percent of the original sample) to 135 firms from the years 1987 to 2005.

Table 4 provides a distribution across industries of the 135 firm that we can link to the ABSNET database. As expected, financial institutions are strongly represented.

Table 5, Panel A reports the asset classes of securitizations for the 135 firms. Automobiles (e.g., General Motors), Credit Cards (e.g., Citigroup), mortgage backed securities (e.g., Wells Fargo) and Home Equity (e.g., Countrywide Financial) are strongly represented in the sample. The numbers 3, 6, 9, and 12 now represent the last month of the fiscal quarter. As can be seen from the totals listed at the bottom of the table, the four fiscal months with the greatest securitization activities are the last month of each of the fiscal quarters. The Chi-square test indicates that the distribution of months is significantly different from a uniform distribution.

Table 5, Panel B reports the frequency of securitization transactions for 24 firms with non-December fiscal year-ends. As can be seen in the table, similar third month of the quarter clustering occurs for these firms. Interestingly, these firms appear to do more securitizations in the second month of the fourth quarter than in the third month of the fourth quarter. Perhaps, as mentioned earlier, firms prefer not to engage in large transactions on the last few days of the fiscal year because it raises red flags with the auditor. Nonetheless the results for the small sample of non-December year-end firms are consistent with firms timing their transactions at the end of the fiscal quarter, at least for the first three quarters.

TABLE 4
Industry Frequencies

SIC Code	SIC Name	n	10-K Sample
6021	National Commercial Banks	34	25.19%
6141	Personal Credit Institutions	14	10.37%
6798	Real Estate Investment Trusts	13	9.63%
6162	Mortgage Bankers and Loan Correspondents	11	8.15%
6035	Savings Institutions, Federally Chartered	9	6.67%
6211	Security Brokers, Dealers, and Flotation Companies	6	4.47%
6172	Finance Lessors	5	3.70%
5311	Department Stores	3	2.22%
6036	Savings Institutions, Not Federally Chartered	3	2.22%
6199	Finance—Services	3	2.22%
3711	Motor Vehicles and Passenger Car Bodies	2	1.48%
4512	Air Transportation Schedule	2	1.48%
5500	Auto Dealers, Gas Stations	2	1.48%
6022	State Commercial Banks	2	1.48%
6153	Short-Term Business Credit Institutions, Except Agricultural	2	1.48%
6159	Misc. Business Credit Institutions	2	1.48%
6311	Life Insurance	2	1.48%
7374	Computer Processing and Data Preparation and Processing Services	2	1.48%
1531	Operative Builders	1	0.74%
3523	Farm Machinery and Equipment	1	0.74%
3531	Construction Machinery and Equipment	1	0.74%
3577	Computer Peripheral Equipment Not Classified Elsewhere	1	0.74%
3721	Aircraft	1	0.74%
4813	Telephone Communications Except Radiotelephone	1	0.74%
4911	Electric Services	1	0.74%
5040	Professional and Commercial Equipment	1	0.74%
5331	Variety Stores	1	0.74%
5621	Women's Clothing Stores	1	0.74%
5731	Radio, Television, and Consumer Electronic Stores	1	0.74%
5961	Catalog and Mail-Order Houses	1	0.74%
6321	Accident and Health Insurance	1	0.74%
6500	Real Estate Agents and Managers	1	0.74%
7200	Personal Services	1	0.74%
7370	Computer Programming, Data Processing	1	0.74%
7372	Prepackaged Software	1	0.74%
9997	Conglomerates	1	0.74%
		135	100.00%

Frequency distribution by industry of firms that disclose securitization transactions in their 10-Ks between 1987 and 2005 that were linked to ABSNET.

TABLE 5
Transactions by Fiscal Month

Panel A: All Firms

Asset Class	1	2	3	4	5	6	7	8	9	10	11	12	Total	Chi-Square
Manufactured Housing	7	4	14	6	10	16	7	5	12	5	5	12	103	21.08
Equipment Leases	0	0	8	6	10	7	8	10	8	10	15	11	93	26.10
Commercial MBS	2	4	3	3	2	3	1	0	3	3	3	4	31	5.77
Automobile Loans	21	21	34	12	26	33	23	43	25	26	38	21	323	30.35
Credit Card	23	32	59	32	49	57	36	52	57	33	57	28	515	46.06
MBS	152	148	183	155	168	190	155	176	182	146	162	167	1,984	14.51
Home Equity	97	112	211	132	111	207	95	111	232	104	119	165	1,696	189.19
Total	302	321	512	346	376	513	325	397	519	327	399	408	4,745	175.98

Panel B: Non-December Year-End Firms

Asset Class	1	2	3	4	5	6	7	8	9	10	11	12	Total	Chi-Square
Total	63	48	75	72	57	75	65	80	93	59	76	61	824	23.69

Number of transactions by fiscal month for 135 firms that were linked to ABSNET by major asset class. There are 24 firms with non-December year-ends. Major Asset Class is defined as an asset class with more than 250 transactions in the ABSNET sample. The Chi-square tests test the null hypothesis that the underlying distribution of the transactions follows a uniform distribution. Ultimate seller was not available for any CDO transactions. Chi-square test is significant at 0.01 level when it exceeds 24.725.

Receivable Build-Up Explanation

Another explanation for our findings is that firms build up receivables to a certain level and systematically securitize them on a month-end or a quarter-end basis. Consistent with the build-up explanation, we observe a greater frequency of transactions occurring in the last few days of months other than quarter-end months. For example in Table 1, in the last five days of January, 14.17 percent of transactions occur rather than approximately 5 percent (5/90 days) one would expect if transactions were distributed uniformly.

We have three responses to this concern. First, why choose the quarter-end or month end? If firms are truly indifferent to timing, then why do they not choose the first day of the month or the middle of the month? We believe that financial reporting incentives likely play a role. Second, some firms, such as Countrywide that continually need cash flows to finance new loans, report key metrics (such as assets, liabilities, and mortgage servicing rights) on a month-end basis. For these firms, financial reporting incentives are not isolated to the quarter-end but affect month-end press releases. Third, our tests examine whether the last five days of quarter-end months are different from the last five days of other months of the quarter. We therefore control for the month-end clustering when examining the significance of our results.

In addition to the responses listed above, we also provide a test that attempts to distinguish the build-up explanation from window-dressing explanation. We utilize the fact that we know the number of times a firm engages in securitization in our 10-K sample. A firm that engages frequently in securitization transactions (more than 12 times a year) is likely to have systems in place to automatically securitize receivables. However, a firm that engages infrequently in securitization (i.e., once or twice a year) will have more flexibility in the timing of the securitization. We therefore, predict that infrequent securitizers will exhibit more quarter-end clustering than frequent securitizers.

Table 6 provides the frequency distribution of securitization transactions for the 135 firms for the period 1987 through 2005. We classify 111 firms as low-volume, *infrequent* securitizers performing fewer than 50 securitizations in the period. There are 18 firms that perform 50 transactions but fewer than 200 transactions over the period (classified as *medium*). These firms are performing about five transactions pre-SFAS No. 125 and ten transactions post-SFAS No. 125. Six firms perform more than 200 transactions over the sample period (Bank of America, Countrywide Financial, General Motors, Wells Fargo, Lehman Brothers, Citigroup) and represent almost half the total transactions. These firms are engaging in approximately 12 transactions pre-SFAS No. 125 and 32 transactions post-125. We classify these firms as *frequent* securitizers.

Table 7 compares the relative proportion of Frequent, Medium, and Infrequent securitizers to engage in transaction in the third month of each fiscal-quarters. Consistent with our prediction across all quarters, infrequent securitizers engage in proportionally more securitizations in the third month. For example, in quarter 1, 50.97 percent of all transactions for the quarter are done in the third month for infrequent securitizers, compared to 44.34 percent for frequent securitzers. For Quarter 2, 43.60 percent of transactions are done in the third month for infrequent securitizers, versus 40.62 percent for frequent securitizers. Note however, that when we examine whether the distribution of the number of transactions in the last month of all quarters differs between frequent and infrequent securitizers we obtain a Chi-square value of 4.19 and p-value of 0.24. Therefore although results are suggestive, we do not have sufficient power to obtain statistical significance.

TABLE 6
Frequency of Securitization by Securitizer Type

	Number of Firms	**Number of Transactions**
Infrequent	85	1–10
	9	11–20
	12	21–30
	1	31–40
	4	41–49
Total for Infrequent	111	935
Medium	10	50–100
	6	101–150
	2	151–199
Total for Medium	18	1,700
Frequent	3	200–250
	1	251–300
	2	>300
Total for Frequent	6	2,110
Overall Total	135	

Frequency of securitization transactions for 135 firms that disclosed securitization transaction in their 10-Ks that were linked to ABSNET for the period 1987 to 2005. The sample period is 1987 to 2005. Reported averages are conditional on the firm engaging in at least one securitization in a give year. "Frequent" refers to firms that had 200 or more securitization transactions in the period. "Medium" refers to firms that had fewer than 200 transactions but 50 or more transactions in the period. "Infrequent" refers to firms that had fewer than 50 transactions in the period.

A second result in Table 7 is also more consistent with window-dressing than with the build-up story. Frequent securitizers show a much greater tendency to engage in securitization in the last five days of the third month of the quarter, than in the last five days of the first or second month of the quarter. For example, in quarter 1, 32.64 percent of the transactions for the quarter occur in the last five days of the third month versus 20.38 percent and 20.00 percent for the first and second month, respectively. Why would receivables build up at a greater rate in the last few days of the third month, relative to other times of the quarter?

Investor Demand for Tranches

A final potential explanation for the clustering we observe is that investors (pension funds, hedge funds, etc.) who purchase the securities demand the securities on the last few days of the quarter to window-dress their own books. We cannot directly determine who buys the securities created by the SPEs since this information is not disclosed. However, we believe that several of our reported results make this explanation unlikely. First, if this was the case, then why would the same logic not hold for debt and equity issues that a are purchased by pension funds and hedge funds? Second, swapping cash for securiti less impact on financial ratios than the sales treatment offered by SFAS No. 125. T it is hard for us to provide a solid explanation for why managers of hedge or pe would demand such an action on the part of securitizers.

TABLE 7
Distribution of Transactions by Month for Firms Linked to ABSNET

Month of Quarter	Frequent				Medium				Infrequent			
	n	% of Quarter	Last 5 Days	% of Quarter	n	% of Quarter	Last 5 Days	% of Quarter	n	% of Quarter	Last 5 Days	% of Quarter
Quarter 1												
1	150	28.30%	108	20.38%	113	28.32%	73	18.30%	39	18.93%	19	9.22%
2	145	27.36%	106	20.00%	114	28.57%	61	15.29%	62	30.10%	31	15.05%
3	235	44.34%	173	32.64%	172	43.11%	83	20.80%	105	50.97%	43	20.87%
Total	530				399				206			
Quarter 2												
1	166	30.24%	110	20.04%	124	26.11%	49	10.32%	56	26.54%	28	13.27%
2	160	29.14%	118	21.49%	153	32.21%	65	13.68%	63	29.86%	27	12.80%
3	223	40.62%	161	29.33%	198	41.68%	93	19.58%	92	43.60%	38	18.01%
Total	549				475				211			
Quarter 3												
1	139	25.93%	114	21.27%	130	28.63%	58	12.78%	56	22.31%	22	8.76%
2	171	31.90%	113	21.08%	146	32.16%	73	16.08%	80	31.87%	28	11.16%
3	226	42.16%	158	29.48%	178	39.21%	78	17.18%	115	45.82%	52	20.72%
Total	536				454				251			
Quarter 4												
1	149	30.10%	109	22.02%	112	30.11%	61	16.40%	66	24.72%	29	10.86%
2	172	34.75%	95	19.19%	126	33.87%	42	11.29%	101	37.83%	21	7.87%
3	174	35.15%	85	17.17%	134	36.02%	43	11.56%	100	37.45%	26	9.74%
Total	495				372				267			
Total	2,110				1,700				935			
Chi-square		70.10[a]		69.73[b]		61.98[a]		42.44[b]		82.46[a]		33.52[b]
(p-value)		<0.001		<0.001		<0.001		<0.001		<0.001		0.001

Distribution of 4,745 securitization transactions that occurred between 1987 to 2005 for 135 firms linked to ABSNET.

"Frequent" refers to firms that had 200 or more securitization transactions in the period. "Medium" refers to firms that had fewer than 200 transactions but 50 or more transactions in the period. "Infrequent" refers to firms that had fewer than 50 transactions in the period. "Last 5 Days" represents the sum of the transactions occurring in the last five days of the month.

[a] Chi-square tests of the null hypothesis that the underlying distribution of transactions across the 12 months follow a uniform distribution.

[b] Chi-square test of the null hypothesis that the sum of the transactions occurring in the last five days of the month are uniformly distributed across the 12 months.

IV. SECURITIZATION GAIN RECOGNITION IN THE INCOME STATEMENT AND QUARTER-END TIMING

Our next test attempts to directly link the timing of securitizations and incentives to manipulation the financial statements. For 195 firm-years in our *10-K sample*, we collect the income statement effects of securitizations from footnotes. Disclosures of the income effects of securitizations are not required in quarterly reports so we limit our analysis to annual income. Prior research suggests that managers are concerned with meeting various benchmarks (reporting a profit rather than a loss, beating last year's earning, meeting or beating analyst forecasts). The survey results of Graham et al. (2005, 2006) suggest that managers will even compromise real economic value to meet earnings objectives. We therefore investigate whether securitization gains are more likely to move earnings *over* these thresholds, while losses will only be reported when doing so *does not* move the firm below these thresholds. In addition, we investigate whether firms that report gains sufficient to move them over the threshold are more likely to engage in securitizations at the end of the quarter.

Table 8, Panel A investigates the relation between securitization gains and losses and the reporting of an accounting profit or loss. We perform the following procedure: (1) classify firms into whether they have reported a profit or a loss; (2) calculate *pre-securitization income* by subtracting off the gain (or adding back the loss); (3) determine how many firms reporting a gain *switch* from reporting a *pre-securitization* loss to post-securitization profit; and how many firms reporting a securitization loss *switch* from reporting a presecuritization profit to a post-securitization loss. We predict that a securitization gain is more likely to move a firm over the threshold and result in a profit, than a securitization loss is to move a firm below the threshold and result in the reporting of negative earnings.

The results in Table 8, Panel A decompose the sample into eight categories based on whether the firm reports a profit or negative earnings before the securitization and whether the income effect of the securitization is a gain, no effect, or a loss. We categorize the proportion of firms that either stay reporting negative earnings, stay reporting a profit, or switch after taking into account the impact of the securitization on income. The results indicate that of the 51 firms that report negative earnings before engaging in securitizations, 35 firms (69 percent) report a gain sufficient to move the firm from reporting negative earnings to a profit. In contrast, only one firm (of 144) that has positive earnings before engaging in securitizations, reports a loss sufficient to move the firm from reporting a profit to a loss. This difference in proportions suggests that incentives to report gains or losses from securitization are not random but depends on the sign of earnings.

In Panel B of Table 8 we investigate the quarter-end clustering of securitizations for each category. The results indicate that of the 35 firms that report gains sufficient to switch them from reporting a loss to a profit, 36 percent of transaction occur in the last five days of the quarter. Interestingly, even in the fourth quarter 32 percent of the transactions are done in the last five days. In all of our previously reported results, quarter 4 had significantly less clustering. The lower frequency of fourth quarter clustering is also observed in other groups reported in Table 8, where only 8 percent or 10 percent of the transactions occur in the last few days (27th to 31st) of December. Firms that are already reporting profits before undertaking the securitization (143 firms) are the least likely to cluster their sec itization at quarter-end. Only 15 percent of transactions occur in the last five days quarter. This is consistent with these firms facing less incentive to engage in management because they were already over the negative earnings threshold.

TABLE 8
An Analysis of Whether the Threshold of Reporting Positive Earnings is Related to Reporting a Gain or Loss from Securitization and Timing Near Quarter-End

Panel A: Income Impact of Securitizations

	Stay Reporting Negative Income	Switch Sign of Earnings after Engaging in Securitizations	Stay Reporting Positive Income	Total
Report Loss from Securitization	0	1 (switch to reporting negative earnings)	11	12
Report Zero from Securitization	2	0	10	12
Report Gain from Securitization	14	35 (switch to reporting a profit)	122	171
Total # of Firms	16	36	143	195

Chi-squared value 6.09 Likelihood Ratio Chi-squared 9.16
p-value 0.19 p-value 0.06
Percent of negative earnings firms that move to reporting a profit: (35/(35+16) = 69%
Percent of profit firms that move to reporting negative earnings: (1/(143+1) = 0.69%

Panel B: Number of Transactions Occurring in the Last Five Days of Each Quarter

	Number of Transactions in Last Five Days of Quarter (% of Quarter Transactions)			
Quarter	**Stay Reporting Negative Earnings Firms = 16**	**Switch to Reporting Negative Earnings Firms = 1**	**Switch to Reporting Positive Earnings Firms = 35**	**Stay Reporting Positive Earnings Firms = 143**
1	6 (46%)	0 (0%)	36 (34%)	70 (24%)
2	3 (38%)	0 (0%)	40 (38%)	56 (17%)
3	3 (33%)	0 (0%)	47 (39%)	56 (18%)
4	1 (10%)	0 (0%)	31 (32%)	21 (8%)
Total for last five days	13 (33%)	0 (0%)	154 (36%)	203 (15%)
Total transactions for Year	40	2	430	1197

Chi-square 11.52 p-value 0.07

Gains is defined as gains from securitizations (from the 10-K filings). Negative gains are firms that report a loss. Pre_Inc. is net income minus gain from securitization. "Stay Reporting a Loss" are observations that have negative Pre_Inc. and negative earnings. "Stay Reporting a Profit" are observations that have positive Pre_Inc. and positive earnings. For securitization loss firms, "Switch" are observations with positive Pre_Inc. and negative earnings. For securitization gain firms, "Switch" are observations with negative Pre_Inc. and positive earnings. Chi-square test is based on the differences between the observed and expected frequencies. Likelihood Chi-square test is based on the ratios between the observed and expected frequencies. There are 142 firms with no transactions recorded in our sample during the period disclosures about securitizations are required.

Table 9, Panel A provides a similar analysis for the benchmark of beating last year's earnings. We: (1) calculate the change in earnings and determine whether the change is positive or negative; (2) calculate the change in earnings had the firm not undertaken the securitization in the current year (pre-securitization earnings less earnings reported last year)

TABLE 9
An Analysis of Whether the Threshold of Reporting a Positive Change in Earnings is Related to Reporting a Gain or Loss from Securitization and Timing Near Quarter-End

Panel A: Proportion of Firms that have Negative or Positive Changes in Earnings before Securitizations and the Impact of the Securitizations

	Stay Negative Change	Switch Sign of Earnings Change after Engaging in Securitizations	Stay Positive Change	Total
Report Loss from Securitization	3	1 (switch to negative change)	8	12
Report Zero from Securitization	3	0	9	12
Report Gain from Securitization	59	37 (switch to positive change)	73	169
Total # of Firms	65	38	90	193

Chi-squared value 7.71 Likelihood Ratio Chi-squared 9.89
p-value 0.10 p-value 0.04
Percent of firms with earnings declines that move to earnings increases: 37/(37+65) = 36%
Percent of firms with earnings increase that move to earnings declines: 1/(90+1) = 1%

Panel B: Number of Transactions Occurring in the Last Five Days of Each Quarter

	Number of Transactions in Last Five Days of Quarter (% of Quarter Transactions)			
Quarter	**Stay Negative Change Firms = 65**	**Switch Negative Firms = 1**	**Switch Positive Firms = 37**	**Stay Positive Change Firms = 90**
1	35 (27%)	0 (0%)	30 (25%)	47 (27%)
2	35 (25%)	0 (0%)	23 (20%)	41 (21%)
3	38 (32%)	0 (0%)	33 (24%)	35 (18%)
4	26 (21%)	0 (0%)	16 (10%)	11 (6%)
Total in last five days	134 (26%)	0 (0%)	102 (24%)	134 (18%)
Total Transactions for Year	508	1	426	732

Chi-square 10.08 p-value 0.12

Gains is defined as gains from securitizations (from the 10-K filings). Negative gains are firms that report a loss. Earnings Change is equal to the change in reported earnings. Change in Pre_Inc. is equal to Pre_Inc less earnings reported in the prior year. "Stay Negative Change" are observations that have a negative change in earnings and a negative change in Pre_Inc. "Stay Positive Change" are observations that have positive change in earnings and a positive change in Pre_Inc. For securitization loss firms, "Switch" are observations that have a positive change in Pre_Inc. and a negative change in earnings. For securitization gain firms, "Switch" are observations that have a negative change in Pre_Inc. and a positive change in earnings. For two firm years a prior year 10-K was not available. Chi-square test is based on the differences between the observed and expected frequencies. Likelihood Chi-square test is based on the ratios between the observed and expected frequencies. There are 140 firms with no transactions recorded in our sample during the period disclosures about securitizations are required.

and classify the firms into whether the change is positive or negative; (3) determine the proportion of firms that stayed reporting a positive change, stayed reporting a negative change, or switched based on the financial statement impact of the securitization. We find that 36 percent of firms (37 out of 102 firms) that have presecuritization earnings below the level of last year's earnings, report gains of sufficient magnitude to switch them to reporting a negative change to a positive change. In only one case is a loss sufficiently large to produce a decline in reported earnings. Panel B investigates the timing of securitizations for these 37 firms. We find that 24 percent of transactions occur in the last five days of the quarter. In contrast only 18 percent of transactions occur in the last five days of the quarter for 90 firms that stayed reporting a positive earnings changes both before and after engaging in securitizations. Interestingly, the results also indicate that for 65 firms that stayed reporting a negative change in earnings, 26 percent engaged in securitizations five days prior to the end of the quarter. We do not have a clear prediction concerning earnings management incentives for these firms. Further analysis (not reported) reveals that this clustering is due to the 59 firms reporting gains and so perhaps they faced incentives to reduce the size of the decline in earnings.[9]

V. SECURITIZATIONS AND THE IMPACT ON THE BALANCE SHEET AND LEVERAGE RATIOS

In this section we examine whether securitizations have a material impact on commonly calculated leverage ratios. Documenting that securitizations have a material impact on the balance sheet is suggestive that the quarter-end clustering could be due in part to window-dressing. However, such evidence is indirect since we do not attempt to identify potential balance sheet manipulators and determine whether they are more likely to cluster transactions at the end of the quarter.

To adjust the financial statements, we read the footnote disclosures mandated by SFAS No. 140 (released in 2000). These disclosures do not perfectly reverse out the accounting. However, we can approximate the impact because firms are required to disclose the *value of receivables outstanding of which the firm has some residual risk.*[10] This disclosure provides information similar to the $1000 from Exhibit 2. To adjust assets, we back out securitization assets already on the firm's books (i.e., the $110 of retained interest in Exhibit 2). For the liability, we need to add back the third-party liability (i.e., the $900 securities sold by the SPE in Exhibit 2). This liability is not disclosed. Therefore, we estimate the liability as equal to the value of the asset ($1000) less any securitization assets already on the firm's books (i.e., the $110 of retained interest in Exhibit 2). For a more detailed discussion of errors induced by these approximations, see Landsman et al. (2008).

Figure 6 provides the impact on the balance sheet for 49 firms with 172 firm-years of data sufficient to make the adjustments to the balance sheet. Due to the effect of extreme outliers, we winsorize observations greater than 100 percent to 100 percent when calculating reported means. Figure 6, Panel A indicates that on average, assets increase by 39 percent, but for 26 percent of the sample, assets increase by over 100 percent. Figure 6, Panel B indicates that liabilities on average increase by 41 percent. Figure 6, Panel C provides the debt-to-equity ratio impact. On average, debt-to-equity ratios increase by 42 percent, but for over 27 percent of the sample, debt-to-equity ratios increase by more than 100 percent. For 9 percent of the sample, debt-to-equity ratios increase by over 500 percent.

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[9] In unreported tests we investigated incentives to meet or beat analysts' forecasts. However, interpreting the findings for analyst forecasts is difficult because an assumption must be made as to whether the analysts forecast the gain or loss from securitization. For infrequent securitizers a zero gain assumption may be reasonable but it is less reasonable for frequent securitizers. Due to this ambiguity we chose not to report these results.

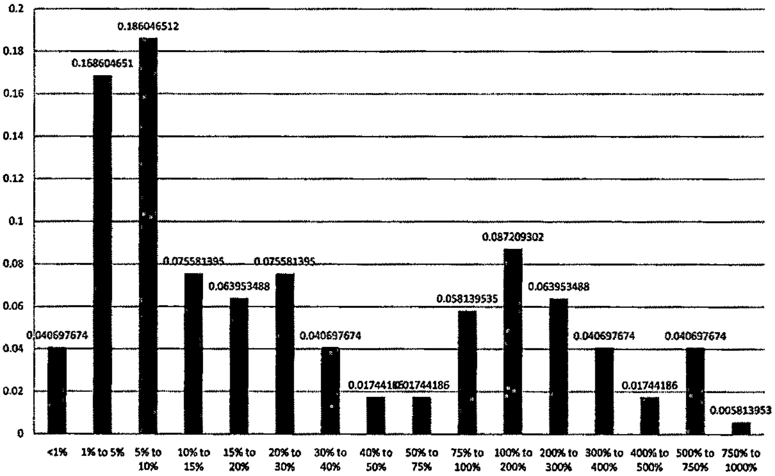
[10] SFAS No. 140 requires that the firm's involvement be more than simply servicing the asset on behalf of the SPE.

These results suggest that securitizations tend to have a material impact on the balance sheet and leverage ratios. Therefore, it is unlikely that managers do not consider the impact on the financial statements when deciding whether to engage in securitizations.

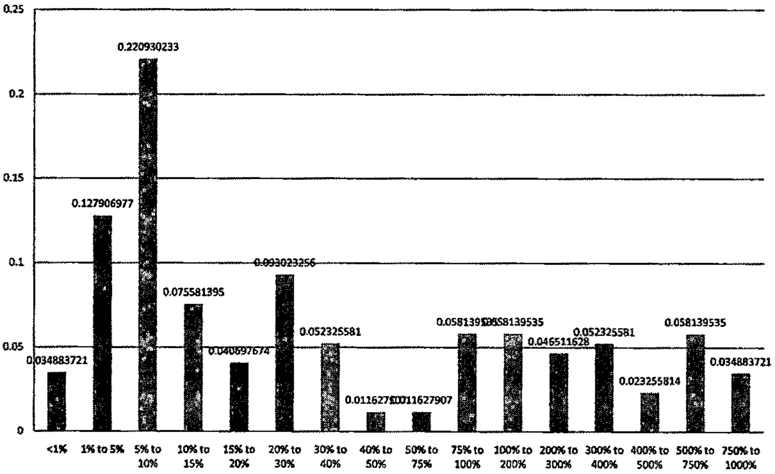
FIGURE 6

Financial Statement Impact of Switching from the Sales Treatment for Securitizations to Collateralized Borrowing for Firms with Adequate Disclosures in Their Annual Reports (means are calculated winsorizing extreme observations to 100%)

Panel A: Percent Change in Assets for 172 Observations (Mean Change 39.3% and Median Change 17.4%)



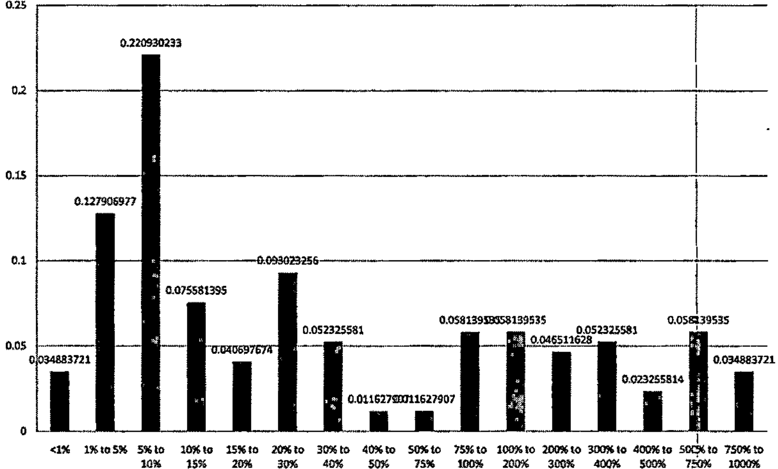
Panel B: Percent Change in Liabilities for 172 Observations (Mean Change 41.5% and Median Change 20.2%)



(*continued on next page*)

FIGURE 6 (continued)

Panel C: Percent Change in Debt to Equity for 172 Observations (Mean Change 41.5 and Median Change 20.2)



Percent change in Assets is measured as [Reported Assets − (Reported Assets plus Securitized Assets less Retained Interest)] deflated by Reported Assets. Percent change in Liabilities is measured as [Reported Liabilities − (Reported Liabilities plus Securitized Assets less retained interest)] deflated by Reported Liabilities. Percent Change in Debt to Equity is measured as (adjusted Debt to Equity) deflated by (reported Debt to Equity) where Adjusted Debt is (Liabilities plus Securitized Assets less retained interest) and Adjusted Equity is (Equity less Gains from Securitizations). Percent change in Cash Flow from Financing is measured as Cash Flow from Financing plus Proceeds from Securitization deflated by Cash Flow from Financing. Percent change in Net Income is measured as Gains from Securitization deflated by presecuritization earnings.

VI. SUMMARY AND CONCLUSION

Sale accounting is required for the vast majority of securitizations. Under the sales treatment, when receivables are transferred to a bankrupt remote special purpose entity, the firm removes the receivables from its books, increases cash by the amount of cash received, and creates an asset (called "retained interest") that reflects the firm's ownership stake in the future cash flows of the securitized assets. Any difference is recorded as a gain or loss from securitization and is reported in the income statement.

We investigate whether the accounting for securitizations provides management with incentives to time their securitization toward the end of the quarter to enhance their abilities to window-dress the financial statements. Consistent with window-dressing, we document that a significantly greater proportion of securitization transactions occur in the last month of the quarter and in the last few days of the quarter. We find that the clustering is consistently strongest in the first three quarters of the year. This is of particular concern since firms are not required to provide detailed disclosures of these transactions in their quarterly financial statements.

It is possible that the clustering we observe could be due to a policy by management to build up receivables to a given level and then securitize them on a month-end or a quarter-end basis. Although we cannot rule out this explanation, we suggest that the build-up story is unlikely to be a complete explanation for the clustering we observe. First, the creation of receivables is likely to occur smoothly and continuously across time, so any day of the quarter could be chosen as the date to securitize. Yet we find that the first day of the new quarter has far lower levels of securitizations than the last day of the quarter. If managers did not care about the financial statement effects, then why would not more of them securitize on the first day of the new quarter? How could one day make a difference to the build up of receivables? Second, we argue that firms that engage infrequently in securitizations are likely to have more discretion in timing their securitizations. We show that there is stronger quarter-end clustering for infrequent securitizers.

We also examine several other competing explanations to window-dressing for our findings. The results from these tests suggest that the clustering does not appear to be driven by underlying customer demand for the assets, nor does the clustering appear to be driven by a demand for quarter-end financing since we do not observe a similar clustering of transactions in debt and equity markets.

As corroborative evidence to support the window-dressing explanation for the clustering we observe, we provide two additional tests. First, we examine whether the reporting of gains and losses from securitizations appear to be strategic. We investigate two common earnings benchmarks, reporting a profit and reporting an increase over last year's earnings. In both cases we find that it is far more common for securitization gains to be of a magnitude sufficient for the firm to beat the earnings benchmark, than it is for a securitization loss to result in a firm missing one of the benchmarks. We also document that firms that report gains sufficient to beat the benchmark are more likely to engage in securitization transactions at quarter-end than other firms that are already over the benchmark before entering the securitization transaction. Second, we provide descriptive evidence on the impact of securitizations on the financial statements. We show that the impact on leverage ratios is substantial, with the average firm showing an increase in liabilities and debt-to-equity ratios of over 40 percent. If firms are concerned with their risk profiles, then such large effects are likely to be seriously considered by management.

We emphasize that window-dressing is not the only reason firms engage in securitizations. Securitizations have economic benefits and would occur no matter what the accounting treatment. Our contribution is to highlight that one potential consequence of allowing managers to use the sales treatment for securitization is an increase in the ability to window-dress the financial statement. In closing, we suggest that the FASB reconsider treating securitizations as collateralized borrowings in cases were firms retain an interest in the underlying cash flows. Such a change in accounting policy would reduce managers' ability to window-dress the financial statements and increase reporting reliability.

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Real Options and Escalation of Commitment: A Behavioral Analysis of Capital Investment Decisions

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ABSTRACT: This study uses experimental methods to explore whether incorporating real options into net present value analysis can reduce escalation of commitment, or the tendency of decision makers to continue to commit resources to a project after receiving negative feedback. This reduction in escalation behavior should occur because the incorporation of real options offers the user greater cognitive accessibility to the possibility of project abandonment. Findings indicate that users of real options exhibit less escalation of commitment than do users of net present value analysis alone. The main result demonstrates that the use of real options in capital budgeting can affect the behavior and decisions of the user even in an experimental setting that controls for the informational advantage of using real options.

Keywords: *real options; escalation of commitment; capital budgeting; sunk cost effect.*

Data Availability: *Available from the author upon request.*

I. INTRODUCTION

This study examines whether decision makers who use real options in capital budgeting are less likely to escalate commitment to a failing course of action than decision makers who use discounted cash flow techniques such as net present value alone. Escalation of commitment occurs when decision makers continue to commit resources to a project after receiving negative feedback about the effects of prior resource commitments (see Staw [1997] for a review). The finding that decision makers escalate commitment to failing courses of action is robust across many settings and conditions, including capital investment situations.

In prior research on the escalation of commitment phenomenon, participants have not been allowed or required to calculate the value of capital budgeting projects using such

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techniques as net present value or internal rate of return, even though the application of such techniques is common in the business world (Graham and Harvey 2001). Of particular interest in this study is the incorporation of real options into capital budgeting techniques. Real options analysis takes the techniques developed to value financial options and applies them to the valuation of other endeavors in which uncertainty is a factor, such as business ventures, product lines, or entire firms. Using real options in capital budgeting involves explicitly considering the value of managerial flexibility over the time a project unfolds. For example, such flexibility exists when management has the right to terminate a project early, expand a project after an initial toehold investment, or extend a product line to better utilize technology investments. Incorporating real options into the capital budgeting process allows decision makers to add the value of management's options to the discounted cash flow value of a project.

Proponents of the real options approach to capital budgeting claim that it results in decisions superior to those made using discounted cash flow techniques alone (Teach 2003; Copeland and Antikarov 2001; Coy 1999; Ross 1995). These arguments are based on the fact that including the value of real options increases the quality of information available to managers. This informational advantage is not tested in this study, as it has been addressed by copious amounts of research (e.g., Newton et al. 2004; Teach 2003; Copeland and Antikarov 2001). However, the use of different techniques can have effects on a decision maker's behavior other than those produced by a difference in information quality. For example, different techniques could highlight the importance of different aspects of the project, leading the manager to focus more on those particular aspects, and ultimately leading the manager to a different decision than might have been made had another technique been used to evaluate the project. There has been very little research on how the use of real options in capital budgeting affects the behavior and decisions of managers in this way. This study explores such behavioral effects by examining whether the use of real options in capital budgeting can affect escalation of commitment.

Whether the use of real options in capital budgeting can reduce the tendency of decision makers to escalate commitment to a failing project is an open question. This study theorizes that because real options techniques involve considering and valuing the option to abandon a project, that option should be more cognitively accessible to decision makers and thus more likely to be exercised. Other research has argued that real options can help overcome "antifailure bias" (McGrath 1999), which suggests that managers who use real options analysis may be less likely to escalate commitment to failing projects. However, some critics of real options in both the academic and popular press have theorized that because there is no specific exercise date or expiration date on an abandonment option, managers may delay abandoning projects past the time when they should be abandoned. They argue that such delays would exacerbate the escalation of commitment problem rather than reducing it (Adner and Levinthal 2004; Zardhooki 2004; Teach 2003; Fink 2001). Thus, it is not entirely clear from theory or past research what effect the use of real options in capital budgeting will have on escalation of commitment to a failing project, and no empirical research to date has directly addressed the question. This study provides evidence to inform the debate.

The question addressed by the current study is important for a number of reasons. The study contributes to the escalation of commitment literature by exploring the boundaries to which escalation generalizes, and by providing a new avenue for mitigating the phenomenon. It contributes to the real options literature by providing theory and empirical evidence to inform the debate as to whether the explicit consideration of real options in capital budgeting affects escalation of commitment. More generally, it provides evidence as to how the use of real options in capital budgeting affects managers' behavior and decisions by demonstrating differences across capital budgeting methods even in an experimental setting that controls for the informational advantage of using real options. The paper also contributes to the management accounting literature by exploring in more depth a judgment bias associated with capital budgeting, namely escalation of commitment, and examining whether the use of real options affects the occurrence of this bias. Finally, it may contribute to practice by offering managers a way to improve firm performance by reducing escalation of commitment.

To address the research question, an experiment was conducted in which participants used either a discounted cash flow method alone or a discounted cash flow method incorporating real options to evaluate a project, and participants' recommendations to continue the project were measured. In the experiment, the participants should make the same decision regardless of capital budgeting method. Any difference in behavior between those using real options and those using discounted cash flow techniques alone, therefore, would be due to psychological or behavioral effects of the techniques. The experiment also addressed the proposed psychological mechanism underlying the effect, as did a second experiment, which corrected for measurement error issues in the first experiment.

The study finds that participants who explicitly consider real options exhibit less escalation of commitment than do users of net present value analysis alone. This reduction in escalation of commitment occurs despite the fact that there is no significant difference in initial commitment to the project between the two groups, both groups were aware of the abandonment option, and both methods should lead to the same conclusion regarding abandonment. The results suggests that the use of real options analysis can have beneficial behavioral effects in addition to yielding information superior to that produced using the net present value method alone.

The remainder of the paper is organized as follows. Section II reviews the extant literature relating to escalation of commitment and real options. Section III describes the hypotheses and related theory. Section IV describes the first experiment. Section V discusses additional evidence on H2, including the results of a second experiment. Section VI discusses the results, implications, and limitations of the study.

II. LITERATURE REVIEW

Escalation of Commitment

Escalation of commitment to a failing course of action, or simply "escalation of commitment" or "escalation," refers to a situation in which a decision maker is faced with negative feedback about a prior decision, but continues to commit resources to the choice despite this negative feedback (see Staw [1997] for a review). This phenomenon has been studied in many contexts since its introduction to the literature over 30 years ago (Staw 1976), including sports (Staw and Hoang 1995), information technology (Drummond 1996; Keil et al. 1994), and management (Miller et al. 1997). Accounting researchers have tended to focus on escalation of commitment in a capital investment setting (Schulz and Cheng 2002; Rutledge and Karim 1999; Chow et al. 1997; Harrell and Harrison 1994; Kanodia et al. 1989), and also on factors that mitigate escalation tendencies (Kadous and Sedor 2004; Cheng et al. 2003; Ghosh 1997; Jeffrey 1992; Beeler 1988).

No escalation of commitment studies in a capital investment setting to date have required participants to apply capital budgeting techniques, so it is unclear whether such techniques can reduce escalation of commitment. However, prior research is informative as to some of the components of the capital budgeting process, including using a quantitative strategy rather than making an intuitive judgment, preparing a report, and using hurdle rates. Conlon and Wolf (1980) address whether using a "calculating strategy" can reduce escalation of commitment. They find that using such a strategy interacts with other factors, but does not have a main effect on escalation. Ghosh (1997) finds that preparing a progress report on the project at the time of the setback can reduce escalation of commitment; however, this study does not address preparing a report during the initial phase of capital budgeting. Studies have also found that the use of organization-set hurdle rates is ineffective in reducing escalation of commitment (Cheng et al. 2003; Schmidt and Calantone 2002). As a whole, these studies do not make clear what effect the use of capital budgeting techniques will have on escalation of commitment.

Real Options

The term "real options" was coined 30 years ago to refer to the use of options valuation techniques in real investment scenarios (Myers 1977). Myers (1977) introduces real options as a way of using financial options theory to value firms, and predicts corporate borrowing patterns as a function of the proportion of firm value accounted for by real options. Since then, numerous researchers in finance and management have studied the use of real options, not only for firm valuation, but also as a supplement to discounted cash flow techniques in capital budgeting (see Lander and Pinches [1998], Trigeorgis [1997], and Dixit and Pindyck [1994] for an overview of this literature). In addition to scholarly research on the subject, a number of consulting firms have been formed and books published to help firms implement real options in practice (e.g., Copeland and Antikarov 2001; Howell et al. 2001; Amram and Kulatilaka 1999).

The use of real options in capital budgeting basically involves considering possible decision points that could arise as a project unfolds and the best response of management at each of these decision points. The value of the project should management choose the best option at each of these points is calculated, and a weighted average of these possible outcomes is taken based on their probability of occurrence. The resulting project value will always be greater than or equal to the net present value of the project without considering real options, since net present value is basically an expected value of all possible outcomes while considering real options involves averaging only those outcomes that would occur should management choose the best course of action at each decision point. The difference between project value considering real options and the net present value of the project reflects the value of flexibility available to management.

One paper to date has examined the connection between real options and escalation of commitment using experimental methodology, although a number of differences set that study apart from the present one. Tiwana et al. (2006) experimentally tests the suggestion of Keil and Flatto (1999) that the presence of real options in a project can sometimes make escalation of commitment a rational phenomenon. The two studies posit that continuing commitment to a project that has suffered a setback may occur because the real options associated with the project make its future value positive, but that value is not apparent because those real options were not considered in placing an initial value on the project. Their scenario is different from that in the current study, which considers a situation in which the future value of the project after a setback is negative, and the value of real options associated with the project is explicitly considered in the valuation stage.

Very few papers have examined the behavioral implications of real options, although a number of real options researchers have called for such an examination (McGrath 1999; Kogut and Kulatilaka 1994; Bowman and Hurry 1993). Those studies that exist in this area (Tiwana et al. 2007; Yavas and Sirmans 2005; Miller and Shapira 2004; Howell and Jagle 1997; Busby and Pitts 1997) are largely concerned with how decision makers perceive the real option value associated with projects in situations where the value of such options has not been explicitly incorporated into the initial project evaluation. Very little has been done to examine whether the use of real options in capital budgeting can lead to superior decisions.

III. HYPOTHESIS DEVELOPMENT

Psychology research has long demonstrated that more accessible cognitive constructs are more likely to influence thoughts and behaviors (Fazio and Towles-Schwen 1999; Fazio and Williams 1986). The accessibility of a cognitive construct is defined as the ease with which it can be brought to mind (Etcheverry and Le 2005; Higgins 1996; Fazio et al. 1986). The accessibility of such constructs as personality traits, goals, attitudes, and choice options has considerable influence on subsequent cognitions, behaviors, and choices (Bargh and Thein 1985; Chartrand and Bargh 1996; Fazio and Towles-Schwen 1999; Posavac et al. 1997). Construct accessibility is often increased through rehearsal, or frequent activation of the construct that occurs over time (Etcheverry and Le 2005; Fazio and Williams 1986; Fazio et al. 1986).

Surveys indicate that in capital budgeting situations, the most commonly used analysis tools are net present value and other discounted cash flow techniques (Graham and Harvey 2001). However, the net present value technique considers only the expected value of a project's future cash flows, and does not explicitly consider the option of abandoning a project before completion. Decision makers who incorporate real options into the analysis, on the other hand, explicitly take into account the flexibility management may have in choosing to abandon a project early or see it through to the end, and calculate a specific value attached to this early abandonment option. Managers who use real options in their capital budgeting decisions as a matter of course, therefore, will be repeatedly exposed to the construct of early project abandonment, while managers who use net present value analysis alone will not. This exposure should heighten the accessibility of the possibility of early abandonment for users of real options valuation analysis relative to users of net present value analysis alone.

Construct accessibility can have a great effect on how decision makers perceive and use the information they receive, and on their subsequent choices and behaviors (Bargh and Ferguson 2000; Ratneshwar et al. 1997; Higgins et al. 1982; Posavac et al. 1997). Psychology studies have found that "differences in construct accessibility led to temporary processing differences, which, in turn, can have long-term behavioral and cognitive consequences" (Higgins et al. 1982). Recently, Posavac et al. (1997) examined how the accessibility of choice options affected the choices selected by research participants. They found that when decision alternatives were clearly specified, decision makers made choices that were consistent with their attitudes. However, when decision alternatives were not specified, decision maker' attitudes played a role in making their choices only if those choice options were cognitively accessible. Capital budgeting projects are scenarios in which choice options are not always specified, and indeed when it is not always apparent that a decision needs to be made at all (Bragger et al. 1998). As suggested by Posavac et al. (1997), in such a situation, the construct accessibility of a choice option such as early abandonment of the project could be crucial in whether the manager eventually takes that option.

Indeed, the construct accessibility of the possibility of abandonment can affect how evidence of impending project failure is perceived and interpreted in the first place. When a cognitive construct is highly accessible, it is more likely to become activated automatically when a relevant stimulus, such as evidence that a project is failing, is encountered (Fazio and Williams 1986). "*Ceteris paribus*, the more accessible or salient a concept, the more likely it will be used in the perception of new information" (Ratneshwar et al. 1997). This suggests that decision makers to whom the possibility of project abandonment is more accessible would be more likely to consider, and act on, the idea of abandoning a project earlier if they encounter signs of project failure. Thus, the tendency to escalate commitment to a failing project should be lower for those to whom the concept of early abandonment is more accessible. This leads to the following research hypotheses:

H1: Decision makers will be less likely to escalate commitment to a failing project when real options are explicitly considered in the planning phase of a capital budgeting project than when discounted cash flow techniques alone are used.

H2: The cognitive accessibility of the possibility of project abandonment mediates the relationship between the capital budgeting technique a decision maker uses and that decision maker's escalation of commitment to a failing project.

IV. EXPERIMENT 1

To test the hypotheses, a 2 × 2 between-subjects experiment was conducted in which the capital budgeting method used by participants and the order in which participants performed tasks were varied. Recommendations to continue the project and construct accessibility of the possibility of abandonment were measured. The method, analysis, and results of Experiment 1 are described below.

Participants

Forty-five Master of Business Administration and Master of Accounting students participated in the experiment. On average, these students were 26.33 years old, had 3.1 years of work experience, and 48.8 percent were female. This population was chosen because of the familiarity of the participants with capital budgeting scenarios and the similarity of the participants to the population of interest, actual business managers.

Procedure

Participants were randomly assigned to one of two conditions in which they played the role of a controller at an electronics firm that used either net present value analysis alone or incorporated real options into the analysis, depending on condition. They were told that their responsibilities included performing financial analysis for capital budgeting projects and making recommendations as to whether such projects should be undertaken or continued. They were also told what capital budgeting technique was used by their firm, including instructions on how to perform an analysis using that technique. They were given an example problem using the firm's capital budgeting technique, and told that they could refer back to the example at any time when performing their own calculations. Participants were then given information about a project, namely the development of an all-in-one cell phone, organizer, and MP3 player. They were given information about the cash flows of the project, its life, and its probability of success (see the Appendix for this information). Participants were then asked to calculate the value of the project using the firm's capital budgeting technique, and to indicate the likelihood that they would recommend funding the project on a 101-point scale ranging from 0 (not at all likely) to 100 (extremely likely). Participants were also asked to defend their choice with a short justification statement.

The information given should lead to an unambiguous choice to undertake the project, as the net present value of the project is $30,960,000 and the value of the project including real options is $39,864,000 (see the Appendix for calculations). Since both these values are positive, participants should unanimously decide to fund the development of the device. Any answers below 50 (undecided) indicate a lack of understanding of capital budgeting techniques, or an error in performing the capital budgeting analysis (four participants [9.76 percent] chose a response below 50; their data as well as that of one participant who failed to respond to the question are excluded from all analyses). The purpose of the decision at this stage is twofold: to determine whether incorporating real options into the analysis results in different project acceptance rates, and to establish the personal responsibility of the participants for the project at hand, which is an important, although not strictly necessary, antecedent condition for escalation of commitment to occur (Schoorman and Holahan 1996; Goltz 1993).

After making the initial project recommendation, half the participants were asked to imagine situations in which they would be called on to perform analysis and make project recommendations once the project is underway. Participants were asked to list these situations, as well as their recommendations for these situations, in the space provided. All participants were then given a memo from the president of the company informing them that the all-in-one project had experienced a major setback; namely, that a competitor had developed a superior product. The memo contained information about sunk costs already incurred in the project, the degree of project completion, and the potential impact on demand. At this point, uncertainty in the project is resolved, which would make the project value and procedure used identical whether net present value analysis is used alone or real options are considered. A correct analysis of the information would yield a net present value of continuing the project as $22,740,000 and abandonment value of $49,500,000 (see the Appendix for calculations), regardless of whether real options are considered, so the economically correct choice would be to abandon the project. Given this information, participants made a recommendation as to whether to continue the project or abandon it by indicating on a 0–100 scale the likelihood that they would recommend continuation, and defended their answer with a short justification statement. After performing this task, the participants who did not previously perform the thought-listing task did so.[1] Finally, participants answered demographic and manipulation check questions.

Design

Experiment 1 is a 2 × 2 split-plot design, in which capital budgeting method (CapBud) is manipulated as a between-subjects variable and timing of recommendation (Time) is manipulated as a within-subjects variable. The first independent variable, CapBud, is manipulated at two levels. Participants were randomly assigned to one of these two conditions. In one condition, participants were told that the firm uses net present value in initial project evaluations, and were asked to calculate the net present value of the project. In the second condition, participants were told that the firm explicitly considers real options in the planning phase of its projects, and were asked to calculate the net present value of the project including the value of real options. The second independent variable, Time, captures the fact that participants made recommendations as to whether to continue the project at two points in time (Time 1 is their initial recommendation and Time 2 is their recommendation to continue after the occurrence of the setback).

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[1] The order in which participants completed the thought-listing task and the project recommendation task was varied to determine whether differences in order affected the results. Participants were randomly assigned to one of two order conditions. The interaction between order and the independent variable was not significant, so the data were collapsed across order conditions in subsequent analyses.

The dependent variable of interest in testing H1 is the participants' recommendation to continue the project (RCP). RCP is measured by participants' recommendation to undertake or continue the project on a 101-point scale ranging from 0 (not at all likely) to 100 (extremely likely). At Time 2, higher RCP scores indicate a greater degree of escalation of commitment. Escalation of commitment is often measured as the amount of money decision makers would commit to the decision, but in this case the decision maker is making a recommendation rather than a monetary commitment. Thus, escalation of commitment is measured on a scale indicating likelihood of recommending project continuation, similar to Kadous and Sedor (2004).

The dependent variable of interest in testing H2 is a measure of the construct accessibility of the possibility of abandoning the project early (CAPA). CAPA is captured using three different measures: (1) whether the participant recommended abandoning the project in any of the situations, (2) the percentage of situations in which the participant's recommendation is to abandon the project, and (3) the rank order in which the participant first lists a situation in which the recommendation is to abandon the project (scaled by number of recommendations). A factor analysis is run on the three measures of CAPA in which one factor was extracted, which explained 92.9 percent of the variance.[2] The factor score for each participant with respect to this factor is the CAPA measure used in the data analysis.[3]

Results

Manipulation Checks

Participants were asked both to what extent they agreed that the firm used net present value and to what extend they agreed that the firm used real options to evaluate its investment decisions on a scale of −5 to 5. The mean responses were significantly different across conditions on both questions ($p < 0.001$), in both cases in the direction indicating that subjects understood the capital budgeting method used by the firm.

Other manipulation check questions asked whether participants agreed that making the right decision was important (at both Time 1 and Time 2), the case was easy to understand, the case was difficult to do, and the case was very realistic. There were no significant differences between the means for the net present value and real options conditions on the importance questions ($p = 0.566, 0.309$), the difficulty question ($p = 0.071$) or the realism question ($p = 0.316$). However, net present value participants found the case easier to understand ($p = 0.002$), but both groups had significantly positive means ($p < 0.001$ for both) indicating that participants in both groups found the case easy to understand.[4]

Test of Hypothesis 1

To test H1, an ANOVA was conducted in which RCP was the dependent measure, CapBud was a between-subjects effect and Time and CapBud × Time were within-subjects effects. Panel A of Table 1 presents the results of this ANOVA, and Panel B of Table 1

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[2] The correlation (p-value) between CAPA1 and CAPA2 was 0.848 ($p < 0.001$), between CAPA1 and CAPA3 0.898 ($p < 0.001$), and between CAPA2 and CAPA3 0.934 ($p < 0.001$). The factor analysis yielded loadings on the extracted factor (correlation coefficients between each variable and the extracted factor) of 0.949 for CAPA1, 0.962 for CAPA2, and 0.980 for CAPA3.

[3] Factor scores are calculated as the sum of the standardized scores for each variable multiplied by the standardized scoring coefficient for that variable. Standardized scoring coefficients are 0.341 for CAPA1, 0.345 for CAPA2, and 0.352 for CAPA3.

[4] A supplemental analysis including this question as a covariate yielded similar results to those discussed in the main analysis.

TABLE 1
Experiment 1
Experimental Results: Recommendation to Continue Project (RCP)

Panel A: ANOVA on RCP[a]

Source of Variation	df	SS	MS	F	p
Between Subjects					
CapBud	1	4103.63	4103.63	7.20	0.01
Subjects (CapBud)	38	21654.30	569.85		
Within Subjects					
Time	1	28325.34	28325.34	46.29	<0.01
CapBud*Time	1	4554.24	4554.24	7.44	<0.01
Residual	38	23251.90	611.89		

Panel B: Least-Squares Means: RCP

	Capital Budgeting Method		
Time	**NPV** **n = 21**	**Real Options** **n = 19**	
Time 1	81.79	82.55	82.17
Time 2	59.21	29.76	44.49
	70.50	56.16	

[a] Likelihood of recommending project continuation measured on a 101-point scale with 0 labeled "Not at all likely," 50 labeled "Undecided," and 100 labeled "Extremely likely." The appropriate error term for CapBud is the Subjects(CapBud) mean square. The appropriate error term for Time and CapBud*Time is the residual mean square.

presents the least-squares mean RCP. Panel A indicates that all effects in the model are highly significant.

The first result emerging from this analysis is the difference between the least-squares means for the two capital budgeting techniques at Time 1.[5] Panel B of Table 1 indicates that the mean RCP for the net present value condition at Time 1 was 81.79, while the mean RCP for the real options condition at Time 1 was 82.55. The difference between these is not statistically significant ($t = 0.100$, one-tailed $p = 0.461$).[6] Thus, there is no significant difference between participants in the two conditions as to whether they initially recommended undertaking the project.

The effect of interest in testing H1 is the difference between the least-squares means for the two capital budgeting techniques at Time 2. Panel B of Table 1 indicates that the mean RCP for the net present value condition at Time 2 was 59.21, while the mean RCP for the real options condition at Time 2 was 29.76. The difference between these is statistically significant ($t = 3.827$, one-tailed $p < 0.001$). This is consistent with H1, which predicts that the real options mean will be less than the net present value mean. Participants in the real options condition displayed significantly lower escalation of commitment than participants in the net present value condition. This effect occurs despite the fact that the two groups did not make significantly different recommendations at Time 1, immediately after the manipulation occurred.[7] There is no significant correlation between recommendations at Time 1 and recommendations at Time 2 (Pearson correlation $= -0.06$, $p = 0.71$).

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[5] Data for participants whose response was below 50 were excluded, as this indicated that they did not properly apply capital budgeting techniques. Including this data does not change the conclusions reached. The least-squares means for each condition when these responses are left in are 78.16 for the net present value condition and 75.48 for the real options condition; these are not significantly different ($F = 0.17$, $p = 0.68$).

[6] The appropriate error term for this contrast, as well as all subsequent planned contrasts, is a linear combination of the Subjects(CapBud) mean square and the residual mean square.

An alternative way to test H1 is to analyze the data based on the percentage of participants who recommended continuing the project in each condition, which can be done if an RCP score of 50 is considered the threshold between recommending continuation versus abandonment of the project.[8] Each RCP score above 50 would indicate a participant who displayed escalation of commitment to the project. Table 2 presents the number and percentage of participants in each condition with RCP scores above 50. An examination of Table 2 reveals that at Time 2, 66.67 percent of participants in the net present value condition displayed escalation of commitment, while only 21.05 percent of participants in the real options condition displayed escalation of commitment. A Chi-square test using the number of participants displaying escalation of commitment at Time 2 indicates that net present value users are more likely to escalate commitment than real options analysis users ($\chi^2 = 8.39$, $p = 0.004$). This is consistent with H1.

Test of Hypothesis 2

A path analysis was performed to test the proposed mechanism by which the capital budgeting technique affects escalation of commitment, namely through the construct accessibility of the possibility of abandonment. This path analysis indicates both the direct effect of CapBud on RCP and the indirect effect of CapBud on RCP through CAPA at Time 2. Results of the path analysis are presented in Figure 1. The path coefficient for the direct effect, −0.3692, is statistically significant (two-tailed $p = 0.021$) and in the expected direction, indicating that participants in the real options condition (coded 1) are less likely to recommend continuing the project than participants in the net present value condition

TABLE 2
Experiment 1
Experimental Results: Number and Percentage of Participants Recommending Continuation[a]

	Capital Budgeting Method		
Time	**NPV** **n = 21**	**Real Options** **n = 19**	
Time 1	n = 21 100.00%	n = 19 100.00%	n = 40 100.00%
Time 2	n = 14 66.67%	n = 4 21.05%	n = 18 45.00%
	n = 35 83.33%	n = 23 60.52%	

[a] Proportion of participants recommending continuation is calculated as the number of participants in each cell whose RCP was greater than 50 as a percentage of total participants in the cell.

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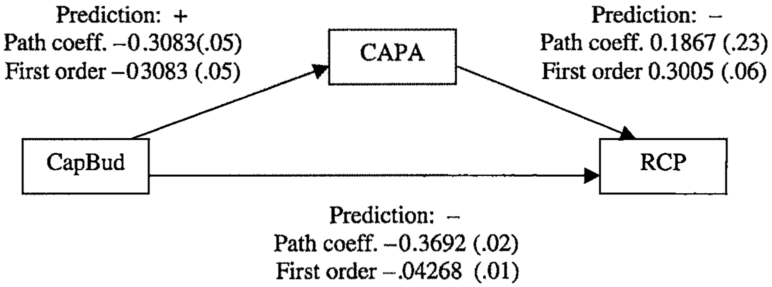
[7] Not all participants performed a mathematically *correct* analysis at Time 1. Repeating the main analysis using only the data from participants who performed a correct analysis does not change the conclusions reached in the main analysis.

[8] An examination of the justification statements written by participants at Time 2 indicates that they viewed RCP scores above 50 as recommending continuation, and RCP scores below 50 as recommending abandonment.

FIGURE 1
Experiment 1
Path Analysis



Path analytic model of CapBud (capital budgeting method), CAPA (construct accessibility of the possibility of abandoning the project early), and RCP (recommendation to continue the project). Path (standardized regression) coefficients are reported on paths with p-values in parentheses. First order correlations are also reported on paths with p-values in parentheses. CapBud is manipulated as either net present value (coded 0) or real options (coded 1) analysis. CAPA is measured as the factor score from a factor analysis of the occurrence, frequency, and rank order of recommendations to abandon the project early in an open-response thought-listing task in which one factor was extracted. RCP is measured as the likelihood of recommending project continuation at Time 2 measured on a 101-point scale with 0 labeled "Not at all likely," 50 labeled "Undecided," and 100 labeled "Extremely likely."

(coded 0). However, the indirect effect of CapBud on RCP through CAPA, which can be obtained by multiplying together the two coefficients on that path, is only −0.0576, which is not statistically significant (Sobel test statistic = 1.09, two-tailed p = 0.276). This is inconsistent with H2.

In addition, the path coefficients linking CapBud to CAPA and CAPA to RCP are puzzling. According to theory, users of real options should display greater construct accessibility of the possibility of abandonment, but the path coefficient from CapBud to CAPA is significantly negative (−0.3083, two-tailed p = 0.053), indicating that using real options actually *decreases* CAPA. Furthermore, higher CAPA should result in lower RCP, but the path coefficient from CAPA to RCP is positive and not statistically significant (0.1867, two-tailed p = 0.231). These results are also inconsistent with H2.

The fact that the results regarding CAPA are in the opposite direction from that predicted indicates that either the effect of the use of real options is working through an alternate, unspecified mechanism, or the measure of the theoretical construct is inadequate. Construct accessibility is a difficult concept to capture, since measuring it directly would increase the accessibility of the construct at hand, thus affecting the participant's response to the measure and performance on subsequent measures. Because an indirect measure must be used, it is possible that the construct was not adequately captured. This possibility will be discussed fully in Section V.

Additional Analysis: Work at Time 2

An examination of work done by participants at Time 2 indicates that some participants performed a new discounted cash flow analysis at that point, while others did not. To investigate the effect of this recalculation on their Time 2 recommendations, a new variable, T2Calc, was coded as 0 if the participant did not perform new calculations at Time 2 and 1 if the participant did perform new calculations at Time 2. An ANOVA was conducted in which RCP at Time 2 was the dependent measure and CapBud and T2Calc were independent measures. The results of this ANOVA are reported in Table 3, along with cell means and cell sizes. These results indicate that while the main effect of capital budgeting technique on RCP at Time 2 is significant (F = 6.06, p = 0.019), as expected, so is the main effect of T2Calc on RCP at Time 2 (F = 9.20, p = 0.005). The interaction was not significant (F = 0.97, p = 0.331). Participants using *either* capital budgeting method were more likely to abandon the project at Time 2 if they performed new calculations at that point.

V. ADDITIONAL EVIDENCE ON HYPOTHESIS 2

Evidence of Measurement Error in CAPA in Experiment 1

The measure of CAPA used in Experiment 1 was an indirect measure, in that participants were not asked directly the extent to which they had considered the possibility of abandonment at the time of the initial project evaluation. Had such a direct question been asked, the additional mention of the possibility of project abandonment would have increased the construct accessibility of that possibility, as construct accessibility is generally increased by more frequent exposure to the construct (Etcheverry and Le 2005; Fazio and Williams 1986; Fazio et al. 1986). Thus, it was impossible to use such a direct measure of CAPA in Experiment 1, as the induced increase in construct accessibility would affect participants' tendency to later escalate commitment to the project under consideration.

TABLE 3
Experiment 1
Experimental Results: Recommendation to Continue Project (RCP) Considering Additional Calculations at Time 2

Panel A: ANOVA on RCP[a]

Source of Variation	df	SS	MS	F	p
CapBud	1	5079.50	5079.50	6.06	0.02
T2Calc	1	7720.65	7720.65	9.20	<0.01
CapBud*T2Calc	1	815.33	815.33	0.97	0.33
Residual	36	30199.08	838.86		

Panel B: Least-Squares Means: RCP[b]

	Capital Budgeting Method		
Time 2	NPV n = 21	Real Options n = 19	
Calculated	30.50 n = 6	15.75 n = 6	23.13
Did Not Calculate	70.70 n = 15	36.23 n = 13	53.47
	50.60	25.99	

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[a] Likelihood of recommending project continuation measured on a 101-point scale with 0 labeled "Not at all likely," 50 labeled "Undecided," and 100 labeled "Extremely likely."

[b] RCP for those who performed additional calculations at Time 2 is not significantly different across capital budgeting conditions (p = 0.42). RCP for those who did not perform additional calculations at Time 2 is significantly different across capital budgeting conditions (p < 0.01).

However, the use of an indirect measure increases the possibility of measurement error in capturing construct accessibility.

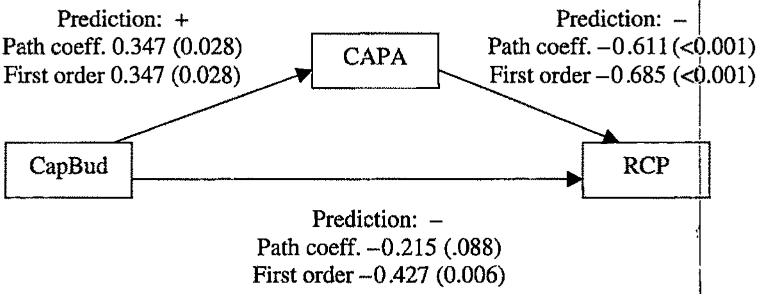
One possible reason that measurement error in CAPA was likely is that participants in the real options condition may not have felt the need to list abandonment among their scenarios since they had already considered such an eventuality when they first calculated the project value. In survey research, it has been found that sometimes respondents exclude information from their answer to a general question that has been addressed in a previous, more specific question in an attempt to provide only information that is "new" (Sudman et al. 1996, 123). If participants in this study followed such a judgment rule, then those in the real options condition who had already explored the possibility of abandonment in depth during their initial project calculation may have avoided listing that eventuality in the open-ended thought-listing task because the concept was not "new," while those in the net present value condition who had not explored the idea in depth would be more likely to mention it in the thought-listing task. The use of such a judgment rule could account for the anomalous findings in Experiment 1 with regard to H2.

One way to assess whether the results of the H2 test in Experiment 1 were due to measurement error in CAPA is to use an alternate measure of the construct. An examination of work done by participants at Time 2 indicates that some participants mentioned the dollar value of abandonment at that point, while others did not. Such mention is not a perfect measure of CAPA because it is made after the setback occurs, when participants are explicitly considering whether to abandon the project. In addition, participants are not required to answer any particular question about abandonment value at that point, so some participants with high CAPA may not have made mention of abandonment. However, such mention would be evidence that participants used the dollar value of abandonment in making their continuation decision, which would indicate that the information was salient to them. Thus, an additional test of H2 using participants' mention of the dollar value of abandonment as a measure of CAPA should indicate whether measurement error existed in the initial measure of CAPA. Results consistent with those using the initial measure of CAPA should increase our confidence that the initial measure captured CAPA well, while inconsistent results should decrease our confidence in the initial measure of CAPA.

A path analysis similar to that represented in Figure 1 was performed using this alternate measure. CAPA was captured using an indicator variable that equaled 1 if the participant mentioned the dollar value of abandonment, and equaled 0 if the participant did not mention the dollar value of abandonment. The results of this analysis are presented in Figure 2. The first-order coefficient for the direct effect, -0.427, is statistically significant ($p = 0.006$), while the path coefficient for the direct effect, -0.215, is not statistically significant ($p = 0.088$) in the presence of the mediating variable. The indirect effect on CapBud on RCP through CAPA, however, is -0.212, which is statistically significant (Sobel test statistic $= -2.76$, $p = 0.006$), as is each piece of that indirect effect. The effect of CapBud on CAPA is 0.347 ($p = 0.028$), and the effect of CAPA on RCP is -0.611 ($p < 0.001$).

These effects are completely consistent with the predictions of H2. There is a significant positive relationship between CapBud and CAPA, and a significant negative relationship between CAPA and RCP, as predicted by the hypothesis. The reduction from a significant first-order direct effect to an insignificant direct effect in the presence of the mediator is consistent with a total mediation of the main effect by the mediator variable (Baron and Kenny 1986). Thus, when mention of the dollar value of abandonment is used as a measure of CAPA, it completely accounts for the relationship between the capital budgeting method used and the tendency to escalate commitment to the project. Although this alternate measure of CAPA is not a perfect representation of the construct, the fact that a path analysis

FIGURE 2
Experiment 1
Path Analysis with Alternate Measure of CAPA


Prediction: +
Path coeff. 0.347 (0.028)
First order 0.347 (0.028)
CAPA
Prediction: –
Path coeff. –0.611 (<0.001)
First order –0.685 (<0.001)
CapBud
RCP
Prediction: –
Path coeff. –0.215 (.088)
First order –0.427 (0.006)

Path analytic model of CapBud (capital budgeting method), CAPA (construct accessibility of the possibility of abandoning the project early), and RCP (recommendation to continue the project). Path (standardized regression) coefficients are reported on paths with p-values in parentheses. First order correlations are also reported on paths with p-values in parentheses. CapBud is manipulated as either net present value (coded 0) or real options (coded 1) analysis. CAPA is measured as whether participants mentioned the dollar value of abandonment at Time 2, coded 1 if they made such mention and 0 if they did not. RCP is measured as the likelihood of recommending project continuation at Time 2 measured on a 101-point scale with 0 labeled "Not at all likely," 50 labeled "Undecided," and 100 labeled "Extremely likely."

based on it yields opposite results from a path analysis based on the original measure of CAPA decreases our confidence in that original measure. This supports the contention that the original test of H2 failed due to measurement error rather than a deficiency in the underlying theory.

Experiment 2

To further address the possibility of inadequate measurement of CAPA in Experiment 1, an additional experiment was conducted in which CAPA was measured in a different, more direct way. Such direct measurement of CAPA precludes a complete path analysis like that conducted in Experiment 1, since directly measuring CAPA would affect escalation of commitment. Thus, the new experiment only examines the first link in the path model, the relationship between capital budgeting method and CAPA. Evidence that this link is positive and significant will support the contention that the cognitive accessibility of the possibility of project abandonment mediates the relationship between the capital budgeting technique used and escalation of commitment.

The experiment was a simple 1 × 2 design in which the capital budgeting method used by participants was varied, and construct accessibility of the possibility of abandonment was measured. The method, analysis, and results of the study are described below.

Participants

Thirty-three Master of Business Administration students participated in the experiment. On average, these students were 30.11 years old, had 9.7 years of work experience, and 28.6 percent were female. This population was chosen because of its similarity to the population used in Experiment 1. Four participants were dropped because they did not complete the dependent variable of interest, leaving 29 participants in the study.

Design and Procedure

The experiment was a simple two-cell design, in which capital budgeting was manipulated as a between-subjects variable. As in Experiment 1, participants were randomly assigned to a condition in which they used either net present value analysis alone or net present value analysis including the value of real options. The experimental scenario was identical to that in Experiment 1 until the point where participants indicated the likelihood that they would recommend funding the project and justified this choice with a short statement. After that point, participants were asked to indicate on a 101-point scale ranging from 0 (did not consider) to 100 (considered extensively) to what extent they considered nine different aspects of the project in deciding whether to recommend the project. These aspects included such factors as the project's cash flows, demand, marketability, and time span. The main factor of interest in this study, however, was "the possibility of abandoning the project before completion," which was used as the measure of CAPA, the dependent variable in the data analysis. After completing these questions, participants answered the same demographic and manipulation check questions as used in Experiment 1.

Results

Manipulation Checks

Participants were asked the same manipulation check questions as in Experiment 1. As in that experiment, participants were asked to what extent they agreed that the firm used net present value to evaluate its investment decisions on a scale of -5 to 5. The mean response was 3.24 in the net present value condition and 2.37 in the real options condition. Both of these means are significantly different from 0 ($p < 0.01$ for both). The difference between conditions, however, is not significant ($p = 0.22$). This is unsurprising considering that net present value is used in both conditions.

Participants were also asked to what extent they agreed that the firm used real options techniques to evaluate investment decisions on a scale of -5 to 5. The mean response was 1.86 in the real options condition and -0.71 in the net present value condition. The mean in the net present value condition is not significantly different from 0 ($p = 0.286$), while the mean in the real options condition is significantly different from 0 ($p = 0.011$). The difference between conditions was significant ($p = 0.010$).

Of the remaining manipulation check questions, only two produced a statistically significant difference between the net present value and real options conditions. Participants in the net present value condition found the case easier to understand ($p < 0.001$) and less difficult ($p = 0.002$) than participants in the real options condition. There were no significant differences in gender, age, or experience across capital budgeting conditions.

Test of the Relationship between Capital Budgeting Method and Construct Accessibility

The relationship between CapBud and CAPA is tested using a one-way ANOVA in which CapBud was the independent measure and CAPA was the dependent measure. Panel A of Table 4 presents the results of this ANOVA, and Panel B of Table 4 presents the mean CAPA for each group. As shown in Panel A, the effect in the model is highly significant ($F = 10.80$, $p = 0.003$). The mean for CAPA in the real options condition (67.67) is significantly higher than that in the net present value condition (32.53). This is consistent with H2 in that it demonstrates that the capital budgeting method used by participants affects CAPA. Furthermore, an analysis of the participants' responses on each of the nine different aspects of the project (not shown) indicates that the possibility of abandoning the project early was the only aspect of the project for which there was a statistically significant

TABLE 4
Experiment 2
Experimental Results: CAPA

Panel A: ANOVA on CAPA[a]

Source of Variation	**df**	**SS**	**MS**	**F**	**p**
CAPA	1	8684.96	8684.96	10.80	0.0028
Residual	27	21712.90	804.18		

Panel B: Cell Means: CAPA

	Capital Budgeting Method	
	NPV **n = 17**	**Real Options** **n = 12**
CAPA	32.53	67.67

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[a] The extent to which participants considered the possibility of abandoning the project before completion when performing capital budgeting analysis, measured on a 101-point scale with 0 labeled "Did not consider," 50 labeled "Considered somewhat," and 100 labeled "Considered extensively."

difference between the two capital budgeting conditions, which helps to eliminate alternative explanations for the relationship between capital budgeting method and escalation of commitment.

VI. DISCUSSION

This study demonstrates that decision makers who incorporate real options into their capital budgeting analyses exhibit less escalation of commitment to a failing course of action than users of net present value analysis. The proposal that the construct accessibility of the possibility of abandoning the project early mediates the relationship between real options usage and escalation of commitment is not supported in Experiment 1, but is supported when a more direct measure of such construct accessibility is used in Experiment 2. This section discusses these results and their implications, and acknowledges some limitations of the study.

Discussion and Implications of Results

Hypothesis 1

The results of Experiment 1 are consistent with H1. Despite the fact that the capital budgeting technique used by participants did not affect the initial decision they made in accepting the project, the technique used did affect their decision to continue with the project after a setback. Participants who considered real options in their analysis were less likely than users of net present value alone to exhibit escalation of commitment to a failing course of action.

This result has implications for both research and practice. The finding adds to the escalation of commitment literature by offering a new avenue for reducing the bias. It adds to the real options literature by exploring to a limited extent the behavioral implications of the use of real options in capital budgeting analysis. This should suggest to real options researchers that the technique has effects beyond providing superior information; it also affects the behavior and decisions of managers even when its use should yield the same results as the use of net present value analysis alone. Hopefully, this will stimulate additional research into the behavioral effects of using real options in capital budgeting. In addition, this study has implications for firms that undertake capital budgeting projects, as it provides evidence that considering real options in the capital budgeting process can be superior to net present value techniques alone in reducing the tendency to escalate commitment to a failing course of action.

In addition, the finding that participants who recalculate the project's discounted cash flow value after a setback exhibit less escalation of commitment than those who do not provides another avenue for reducing escalation of commitment. It suggests that capital budgeting techniques should not be used solely in the initial evaluation stage of a project, but that they should be applied throughout a project as new information becomes available. Performing new analyses at later stages of a project can potentially reduce escalation of commitment regardless of the capital budgeting technique used.

Hypothesis 2

The results of Experiment 1 did not support H2. However, these results were likely the result of measurement error in capturing construct accessibility of the possibility of early abandonment. This deficient measurement was addressed by conducting a second experiment in which CAPA was measured more directly, and the link between capital budgeting technique and CAPA was tested. In Experiment 2, participants were asked to rate the extent to which they considered the possibility of early abandonment at the time they made the decision as to whether to undertake the project. This offers a measurement of CAPA that is much more in line with its actual definition and more representative of the mental state of participants than the measure used in Experiment 1. Because a more direct measure was used, however, escalation of commitment could not be assessed after measuring CAPA because of the likelihood that the measurement would interfere with subsequent decisions. Thus, only the first part of H2, that the capital budgeting method used by participants would affect CAPA, could be tested using the data from Experiment 2.

The results were consistent with H2; participants who used real options in the capital budgeting process had higher construct accessibility of the possibility of early project abandonment than participants who used net present value alone. Furthermore, there were no significant differences across capital budgeting conditions in the extent to which other factors were considered by participants—the future cash flows of the project, the probability that demand would be high versus low, the marketability of the product, the time span of the project, the impact of the project on performance evaluation, the incurrence of R&D costs, project value, or other aspects of the project. The only significant difference among the project factors was in the extent to which the possibility of abandoning the project before completion was considered. This result helps to eliminate other potential reasons as to why escalation of commitment might differ between participants who use real options as part of the capital budgeting process and those who use net present value alone.

Although the results of Experiment 2 do not allow the construction of a complete path diagram as did Experiment 1, they lend support to the theory underlying the main results of Experiment 1, that the construct accessibility of the possibility of abandonment is higher for those using real options, and that this in turn affects the tendency of decision makers using real options to display less escalation of commitment to failing projects. Because Experiment 2 used a more direct measure of CAPA, this variable is subject to less measurement error than the measure used in Experiment 1, and is therefore more likely to capture the true nature of the construct.

Limitations

It is possible that participants in the NPV condition who performed additional analysis at that time could have displayed escalation of commitment simply because they were following the instructions on how to perform an NPV analysis given in the experimental instrument. As those instructions pertained to performing an NPV analysis at the outset of the project when only one course of action was under consideration, they did not address a situation in which participants had to compare two potential courses of action, namely, continuing the failing project versus abandonment. Subjects performing such an analysis at Time 2 could have recommended to continue the project simply because the net present value was positive at that time, and the experimental instructions indicated that projects with a positive net present value should be approved.

However, as indicated in the analysis of work done at Time 2, participants in the NPV condition who performed additional analysis at that time displayed significantly *lower* escalation of commitment than those who did not perform additional analysis (see Table 3). Thus, it is highly unlikely that the results are driven by those participants in the NPV condition who decided to continue the project because their additional analysis at Time 2 yielded a positive net present value.

Another limitation of this study is that, as in any experimental study, the case is abstracted from reality, and considerably simpler than capital budgeting situations that would occur in an actual business setting. Although the psychological effect should generalize to actual business settings, it is unknown whether other factors might affect the results found here. In addition, the research participants are students, and although they should exhibit the same cognitive biases as working managers, it is unclear whether working managers actually would respond in the same way.

Conclusion

This study conducts an experiment to test whether the consideration of real options in capital budgeting affects escalation of commitment to a failing course of action. Results indicate that although the consideration of real options does not have a significant effect on the initial project acceptance decision, those participants who explicitly considered real options during the initial project evaluation were less likely to exhibit escalation of commitment to the project after the introduction of a setback than participants who used net present value analysis alone. In addition, results of a second experiment support the theory that the reduction in escalation of commitment among real options users is due to heightened construct accessibility of the possibility of early project abandonment at the time capital budgeting procedures are applied.

APPENDIX
CASE AND SOLUTIONS

Case Given to Experimental Participants

The aim of this project is to develop a device that includes a cell phone, electronic organizer, and 20GB MP3 player in one handheld unit. The product has already been developed by the R&D department, but the project will require an additional $100,000,000 to build the production technology. This production technology can be sold at 55 percent of the value invested to date at any point during project development if the project is discontinued. The marketing department has reported that the project's expected cash flows will depend upon demand. There is a 60 percent chance that demand for the product will be high, with net cash flows of $60,000,000 per year, and a 40 percent chance that demand will be low, with net cash flows of \$10,000,000 per year (we will learn which outcome will occur as soon as development is complete). Thus, the expected cash flows for the project are \$40,000,000 per year (0.6 × \$60,000,000 + 0.4 × \$10,000,000). The project is expected to last 5 years. The company's required rate of return is 16 percent.

Initial All-In-One Project Value Using Net Present Value and Real Options Analysis

Net Present Value

Find the present value of expected cash flows from the project and subtract the initial investment.

Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
\$(100,000,000)	\$40,000,000	\$40,000,000	\$40,000,000	\$40,000,000	\$40,000,000

× 1
\$(100,000,000)

\$40,000,000 × 3.274 = \$130,960,000

NPV = \$130,960,000 − \$100,000,000 = \$30,960,000

Real Options Value

Find the present value of each possible scenario, choose the best outcome for each scenario, weight those outcomes by their probability of occurrence, and subtract the initial investment.

Scenario 1: The project earns \$60,000,000 per year, and the firm chooses to continue the project.

Year 1	Year 2	Year 3	Year 4	Year 5
\$60,000,000	\$60,000,000	\$60,000,000	\$60,000,000	\$60,000,000

PV = \$60,000,000 × 3.274 = \$196,440,000

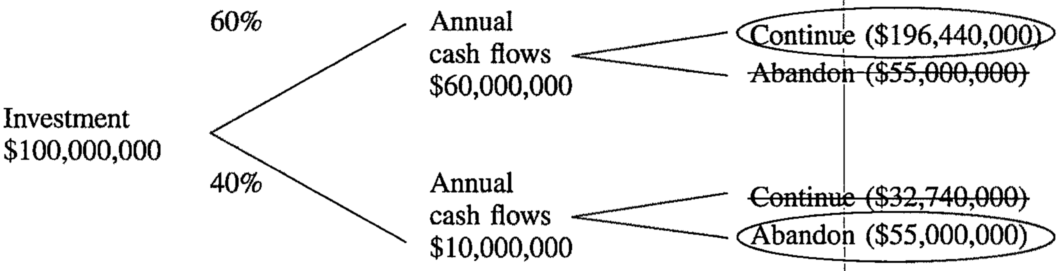
Scenario 2: The project earns \$10,000,000 per year, and the firm chooses to continue the project.

Year 1	Year 2	Year 3	Year 4	Year 5
\$10,000,000	\$10,000,000	\$10,000,000	\$10,000,000	\$10,000,000

PV = \$10,000,000 × 3.274 = \$32,740,000

Scenario 3: The firm chooses to abandon the project.

The firm will earn $100,000,000 × 55 percent = $55,000,000 from selling the production technology, so PV = $55,000,000.


Investment
$100,000,000
60%
40%
Annual cash flows $60,000,000
Annual cash flows $10,000,000
Continue ($196,440,000)
~~Abandon ($55,000,000)~~
~~Continue ($32,740,000)~~
Abandon ($55,000,000)

Proj. value = ($196,440,000 × 60 percent) + (55,000,000 × 40 percent) − $100,000,000
= $39,864,000

Now the project value should be broken down into its discounted cash flow value and the value of the abandonment option:

Breakdown:	DCF Value	$30,960,000 (NPV of expected cash flows)
	Option Value	8,904,000 (plug-in)
	Project Value	$39,864,000 (Real options value)

Value of All-In-One Project after the Setback Outlined in the President's Memo

Net Present Value

Find the present value of expected cash flows from the project and subtract the initial investment.

Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
$(10,000,000)	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000
× 1	$10,000,000 × 3.274 = $32,740,000				
$(10,000,000)					

NPV = $32,740,000 − $10,000,000 = $22,740,000

Abandoning the project would bring in $90,000,000 × 55 percent = $49,500,000

Real Options Value

The value using real options analysis is the same as that using net present value analysis, as there is no uncertainty to be resolved at this point.

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The Timing of Earnings Announcements: An Examination of the Strategic Disclosure Hypothesis

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ABSTRACT: Beginning with Patell and Wolfson (1982), several papers have documented that earnings announcements made after the market closes and/or on Fridays tend to contain worse earnings news than those made at other times. One hypothesis is that opportunistic managers release earnings at these times of decreased media attention to "hide" their bad news and reduce the associated market penalty. Using firm-level tests that focus on only those firms that *switch* their disclosure timing (rather than consistently report at the same time), we find no evidence that managers opportunistically report worse news after the market closes or on Fridays. We then explore other determinants of the timing decision, including the more benign hypothesis that managers with worse earnings news release earnings after the market closes to more broadly disseminate the information. Consistent with desiring more time for the market to assimilate the announcement, we find some evidence that more complex firms tend to announce earnings after the market closes. We also find that these announcements are associated with greater abnormal volume, possibly indicating a successful dissemination strategy. We also find that the corporate headquarters location, the size of the firm, the number of analysts covering the firm, and industry membership are all significant explanatory variables for the timing decision. Overall, our findings are consistent with efficient capital markets that are effective at monitoring new information, regardless of the time of the announcement.

Keywords: *strategic disclosure; earnings announcements; disclosure timing; market efficiency.*

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I. INTRODUCTION

In this study, we examine *why* earnings news released after the market closes and/or on Friday tends to be worse than that released at other times. Patell and Wolfson (1982) first document this empirical regularity, employing tests between pooled groups of firms that disclose at different times of the day, finding that earnings released after the market had closed were more likely to contain bad news. Several subsequent studies (e.g., Penman 1987; Damodaran 1989; DellaVigna and Pollet 2009; Bagnoli et al. 2005) have verified these findings and also documented that Friday earnings announcements tend to have worse news than those released on other days.

While the empirical finding that worse news is disclosed in earnings announcements released after the market closes and/or on Fridays is well documented, the reasons behind this pattern are still unclear. One possibility, which is consistent with conventional wisdom in many disciplines and alluded to in several papers (Patell and Wolfson 1982; Penman 1987; Damodaran 1989), is that managers are opportunistically timing their announcements of bad news to take advantage of reduced media coverage and investor attention at the end of the business day and/or on the weekend. In other words, managers are "hiding" bad news by releasing the news during periods of investor inattention in order to mitigate the negative market reaction. Throughout the rest of the paper we refer to this as the opportunism hypothesis. Patell and Wolfson (1982) however, are careful to point out that, although their findings are consistent with opportunistic behavior, their findings could also be reflective of a benign strategic decision by management to more broadly disseminate the information. Nevertheless, their tests are designed merely to document the empirical regularity and do not distinguish between the opportunism hypothesis and competing explanations. Thus, the focus of our paper is to (1) design tests that determine whether managers are acting opportunistically in the earnings announcement timing decision and (2) shed light on other explanations for this empirical regularity (e.g., the assimilation hypothesis).

As noted, several papers have found that firms tend to release worse news after the market closes and/or on Fridays. In each of these papers, a comparison is made between pooled groups of firms making disclosures at different times of the day and/or on different days. However, we argue that prior results may be influenced by sample firms that do not change the timing of their earnings announcements (i.e., the firms that consistently report at the same time of day or on the same day of the week). If firms are opportunistically *changing* the timing of their earnings announcements due to anticipated good or bad news, a more powerful test to detect this opportunistic behavior involves eliminating the "consistent" reporters from our sample and focusing only on those firms that are actively changing the timing of their earnings announcements. With this more focused sample of "switching" firms, we then conduct within-firm tests of these companies that are switching between (1) reporting earnings before the market opens (BMO) and after the market closes (AMC) and (2) announcing earnings on Monday–Thursday versus Friday.[1]

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[1] We eliminate from our analyses earnings announcements made during trading hours because they represent only 4.3 percent of the initial sample. This also creates a clearer distinction between our two groups (BMO and AMC).

Our results generally find little to no support for the opportunism hypothesis. That is, we find no significant evidence that managers opportunistically engage in intraday or intraweek earnings announcement timing as a result of anticipated good or bad news. Specifically, we first identify consecutive earnings announcements where managers switch from BMO to AMC. In this case, the opportunism hypothesis suggests that managers will switch to reporting AMC to avoid media coverage due to anticipated bad news. Using the firm as its own control, we compare the difference in earnings surprise between the prior quarter (BMO) and the current quarter (AMC), and find that the mean difference is insignificant. Similarly, the difference between the two quarters in the percentage of earnings announcements that meet or beat the mean analyst consensus forecast (*MBE%*) is not significant. We then identify consecutive earnings announcements where managers switch from AMC to BMO. In this case, the opportunism hypothesis predicts that managers will switch to reporting BMO to gain additional media coverage for the anticipated good news. Again, we find that the mean difference in earnings surprise and *MBE%* between the two quarters is insignificant. In similar tests, we also find no significant evidence of opportunistic behavior when examining firms that switch between Monday–Thursday announcements and Friday announcements.

In addition to the above tests, which compare switches between two consecutive quarters, we examine the mean earnings news for firms that switch at any time during our sample period (2000–2005). If managers are opportunistically timing earnings announcements, then the mean earnings news of all the firm's AMC quarters should be lower than all its BMO quarters. Similarly, the mean earnings news of its Friday quarters should be lower than its Monday–Thursday quarters. Once again, these tests fail to provide significant evidence that would support the opportunism hypothesis.

Finally, since the incentive to engage in opportunistic disclosure is driven by an attempt to "hide" bad news from the media and investors, it seems logical that certain firms may be better able to take advantage of lower media/investor attention. Hence, we examine the effect of cross-sectional differences in firm coverage (e.g., number of analysts) on the opportunism hypothesis. Using sample partitions based on low or high media/investor coverage, we continue to find little or no evidence supporting the opportunism hypothesis.

Since we find no evidence that managers are timing earnings announcements in an attempt to obfuscate bad news, we next attempt to identify other firm characteristics that explain the BMO/AMC choice. Consistent with the conjecture by Patell and Wolfson (1982) that firms releasing earnings AMC do so in an attempt to more broadly disseminate the information (i.e., the closure of the market allows for a longer period of evaluation by a greater set of market participants), we find that firms likely needing more assimilation time for their earnings announcements tend to announce AMC more frequently. For example, firms that are more complex (more volatile cash flows and more geographic and operating segments) tend to report AMC rather than BMO. Also consistent with a successful assimilation strategy, we find that AMC announcements are associated with greater abnormal volume, suggesting that the timing of the disclosures may allow for a larger set of investors to participate.

In addition, we find that the most significant explanatory variable for the AMC/BMO decision is corporate location. Firms in the Eastern and Central time zones are much more likely to announce earnings BMO than Western firms.[2] Firms also tend to cluster BMO or

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[2] Note that Patell and Wolfson (1982) find virtually no timing differences between East and West Coast firms. However, it makes sense that West Coast firms would be less likely to announce earnings BMO, since the market opens at 6:30am on the West Coast.

AMC by industry, with the majority of industry indicator variables being significant. Finally, we find that AMC firms tend to be much smaller and have relatively greater analyst coverage.

This paper contributes to the existing literature in several important aspects. First, our results help to shed light on the reasons behind the empirical regularity that AMC and Friday earnings announcements tend to contain worse news. Although conventional wisdom interprets this finding as being a result of opportunistic managers trying to "fool" the market and hide bad news, our results are indicative of more benign managerial motives (e.g., an attempt to allow investors to assimilate complex information) and institutional factors (e.g., corporate location and industry membership). In sum, we (1) rule out the idea that managers are acting opportunistically on average with respect to the timing of their earnings announcements, (2) find some support that the release of worse news AMC and/or on Fridays is driven by a managerial attempt to provide more time for the assimilation of the new information, and (3) identify other determinants of the earnings announcement timing decision such as the location of corporate headquarters and industry membership. Together, our findings are consistent with efficient capital markets that are effective at monitoring new information, regardless of the time of the announcement. Our paper improves our understanding of the efficiency of capital markets with regard to the timing of information disclosures and provides a more comprehensive understanding of the determinants of earnings announcement timing.

Next, our methodology develops more powerful tests to identify whether managers are acting in an opportunistic manner. Instead of focusing on pooled tests as in past research, we identify firms that are actively switching their disclosure practices from one quarter to the next and exploit firm-level differences for our tests. Although our sample size is reduced as a result of focusing only on "switchers," we believe that tests of the opportunistic disclosure hypothesis on these firms alone are ultimately more powerful due to the elimination of noise from those firms that do not appear to be acting strategically. The more focused format of our tests is applicable to other researchers who are attempting to identify strategic managerial behavior.

Finally, we obtain a unique, large, hand-collected database from a new source, the *Wall Street Journal Online*, which extends from January 2000 through December 2005.[3] As Bagnoli et al. (2005) point out, the media environment over the past several years has evolved toward 24/7 media coverage of financial information as reported on by popular cable channels such as CNBC and Bloomberg and Internet websites like *The Motley Fool* and *TheStreet.com*. As a result, we are able to replicate the pooled results of prior research in an environment where conventional wisdom is less likely to hold. Providing access to our database will allow other research to be done that requires the exact time of the earnings announcement, which is not currently available on common databases such as Compustat.

II. PRIOR RESEARCH AND HYPOTHESES DEVELOPMENT

Prior research documents that good news tends to be released during specific days of the week as well as time of day.[4] Patell and Wolfson (1982) document that good news is more likely to be released while the markets are open, whereas bad news is more likely to appear after the market closes. Damodaran (1989) finds that Friday earnings announcements are more likely to contain negative news relative to Monday–Thursday earnings announcements (also see Penman 1987; DellaVigna and Pollet 2009; Bagnoli et al. 2005). Bagnoli et al. (2005) perform a more recent study (from 2000 to 2003) and continue to find that earnings announcements made on Fridays are more negative, especially for those announced after the market opens. They also find that news announced after the market is closed tends to be more negative than announcements made before the market is open.

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[3] This database is available from the authors upon request. Bagnoli et al. (2005) also examine a more recent time period (2000–2003), using the proprietary Reuters Forecast Pro database.

[4] Prior research on earnings announcement timing has generally examined the timing of the announcement from the end of the quarter (Niederhoffer and Regan 1972; Pastena and Ronen 1979; Givoly and Palmon 1982; Chambers and Penman 1984; Kross and Schroeder 1984; Kalay and Loewenstein 1986; Penman 1987; Begley and Fischer 1998). However, our question deals with the intraday and intraweek timing of the announcement and is thus not directly related to these papers.

While this empirical regularity of worse news being announced AMC and/or on Fridays is well documented, the reasons behind this pattern have not been empirically explored. Patell and Wolfson (1982, 525) suggest two possibilities: (1) managers are acting opportunistically to "hide" bad earnings news during times of lower media and investor attention or (2) managers are "attempting to provide a natural no-trading period for the dissemination and evaluation of news releases, and that they employ this strategy more frequently when they have less favorable news to report." We begin by empirically investigating the first explanation: that managers are opportunistically attempting to gain an advantage by releasing bad news during times of lower media and investor attention. This theory focuses on managers' perceptions that the market digesting the information can be "fooled" by releasing bad news when the market is not fully functioning (e.g., after the market was closed or on weekends). Thus, a manager with bad news could announce it during these less efficient times and receive less of a market penalty for the bad news. Likewise, the manager with good information would announce it when the market was fully functioning to receive the greatest reward. The implied assumption on the part of the opportunistic manager is that the market is less informationally efficient at certain times. Thus, the initial tests in the paper determine whether managers act *as if* they believe that markets are less efficient at processing new information at certain times and/or on certain days.

Common to all the above studies that document worse earnings news being released AMC and/or on Fridays is the use of pooled, cross-sectional tests as the primary research methodology.[5] We argue that the use of pooled, cross-sectional tests significantly reduces the ability to detect true opportunistic disclosures related to anticipated good or bad earnings news. For example, of the approximately 3,200 firms in our final sample, more than 21 percent had a consistent disclosure policy during the six-year period covered by our sample. Including these firms in tests of the opportunism hypothesis can (1) bias the results due to systematic characteristics of these "consistent" reporters and (2) introduce noise because the firms do not engage in strategic timing.

In contrast to the pooled, cross-sectional tests used in prior research, our main tests focus on *firm-level* changes in earnings announcement timing patterns. We believe this research-design choice offers the most powerful test of the opportunism hypothesis.[6] That is, by focusing on firm-level announcement patterns, we can more effectively target those firms that are opportunistically choosing the timing of good or bad news. For example, a firm that *switches* from announcing its earnings BMO to announcing its earnings AMC seems to offer the most powerful test of a firm opportunistically changing its earnings announcement timing as a result of anticipated bad news. In contrast, a firm that *always* announces its earnings AMC would seem to be announcing its earnings at that time for reasons other than trying to avoid media coverage due to bad news. These opportunistic firm-level earnings announcement patterns lead to the following hypotheses:

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[5] While not the focus of the Bagnoli et al. (2005) paper, they do mention in the text untabulated pooled results for firms that switch their disclosures between AMC and BMO or between Monday–Thursday and Friday.

[6] Although this reduces the sample size for our tests, as long as the underlying population of earnings announcements is large (our total announcements are 51,352 over 6 years) the observation of a small number of "switching" firms is *prima facie* evidence that firms are not opportunistically timing their announcements based on the type of news. In other words, if we found only 2 or 3 firms that switched the timing of their earnings announcement during the sample period (out of 50,000+ total firms) that would be strong evidence that firms are not acting opportunistically (despite the extremely small sample size). Therefore, any concerns with power should really be focused on the size of the total population of earnings announcements from which the "switchers" are drawn.

> **H1a:** Firms that switch from announcing earnings BMO to AMC (AMC to BMO) report worse (better) earnings news in the current quarter than in the prior quarter.
>
> **H1b:** Firms that switch from announcing earnings on Monday–Thursday to Friday (Friday to Monday–Thursday) report worse (better) earnings news in the current quarter than in the prior quarter.

It is possible that limiting our analysis to the current and prior quarter may not pick up the *average* level of news in BMO quarters versus AMC quarters. For example, a firm may switch after four consecutive BMO announcements to four consecutive AMC announcements (e.g., because the firm experienced an entire year of poor results) then back to a consistent BMO pattern. Therefore, we extend our hypotheses to compare each firm's mean difference in all BMO quarters versus all AMC quarters (for each firm that has at least one BMO quarter and one AMC quarter during our sample period). Stated formally, we hypothesize that:

> **H2a:** For a firm that reports at least one earnings announcement BMO and one AMC, the mean earnings news will be worse for the AMC quarters than for the BMO quarters.
>
> **H2b:** For a firm that reports at least one earnings announcement on Monday–Thursday and one on Friday, the mean earnings news will be worse for the Friday quarters than for the Monday–Thursday quarters.

In these tests, and in the prior tests for H1, our research methodology eliminates those firms that *always* announce earnings AMC (or Friday) or BMO (or Monday–Thursday), since those firms do not appear to be strategically timing their earnings announcements as a result of the type of earnings that will be released. Also note that in contrast to the pooled tests used in prior research, our firm-level tests use the firm as its own control for comparison of good versus bad earnings news. This has the advantage of reducing the possibility of other omitted, correlated variables causing the observed differences in earnings news.

Our final hypotheses focus on cross-sectional differences in media/investor attention. The conventional wisdom underlying the opportunism hypothesis generally emphasizes the ability of the firm to avoid intense market-wide coverage by announcing relatively worse news when media and investor attention is lower (i.e., AMC and/or on Fridays). It is also generally assumed that all firms are *equally* able to take advantage of reduced media/investor attention. However, if the opportunism hypothesis is descriptive, then it is possible that its effects would be strongest for those firms that are not as intensely followed by the media and investors. For these less visible firms, there would likely be a smaller group of reporters, analysts, and investors to dissect an after-hours announcement. Similarly, for more highly covered firms, it seems less likely that they would be able to "hide" bad news by strategically timing their announcements. These hypotheses take advantage of firm-specific characteristics that should differentially affect the relation between the type of earnings news and the timing of the earnings announcement. As a result, they create more focused tests of the opportunism hypothesis. Our final hypotheses are stated as:

H3a: Firms that have less media and investor attention will be more likely to report mean earnings news that is lower for AMC quarters than BMO quarters.

H3b: Firms that have less media and investor attention will be more likely to report mean earnings news that is lower for Friday quarters than Monday–Thursday quarters.

III. RESEARCH METHODS

This study requires the identification of the time and day when a firm reported its earnings announcement. Our sample selection process is detailed in Table 1, Panel A. We

TABLE 1
Sample and Descriptive Statistics

Panel A: Sample Selection

Identified earnings announcements from the *Wall Street Journal Online* from 2000 to 2005	93,393
Less announcements with insufficient information to identify the time of the release	(11,447)
Total announcements from the *Wall Street Journal Online* with the time of the release identified	81,946
Less announcements without I/B/E/S data needed to calculate earnings news	(28,278)
Less announcements made during market trading hours	(2,316)
Earnings announcements used in univariate tests	51,352

Panel B: Descriptive Statistics of the Earnings Announcement Sample

Variable	Mean	Std. Dev.	Q1	Median	Q3
Earnings Surprise	0.0099	0.1065	−0.01	0.01	0.03
MBE%	72.2	44.8	0.0	100.0	100.0
ROE	−0.18	38.28	0.00	0.02	0.04
MarketCap	4,595	18,998	283	775	2,400
#Analysts	7.2	6.2	3.0	5.0	10.0
INST%	58.07	26.45	39.03	60.43	77.74

The earnings announcements were collected from the *Wall Street Journal* website from 2000 (the first complete year data is available) through 2005. The website indicates whether the earnings announcement was made before the market opens (BMO), during the market trading hours, or after the market closes (AMC).

Variable Definitions:

Earnings Surprise = I/B/E/S Actual Earnings – the mean I/B/E/S analyst forecast; we delete *Earnings Surprise* in excess of +/− $1.00 per share;

MBE% = percentage of firms that meet or beat the mean analyst consensus earnings estimate;

ROE = income before extraordinary items divided by book value of common equity for the current quarter;

MarketCap = quarter-end market capitalization (in millions) of common equity;

#Analysts = number of analysts following the firm at quarter-end; and

INST% = percentage of common shares held by institutional investors at quarter-end.

first collect the timing of the earnings announcement from the *Wall Street Journal* website from 2000 (the first complete year data is available) through 2005.[7] This yields 93,393 earnings announcements, of which 11,447 do not have sufficient information to determine the time of the announcement. Next, we merge this data set with I/B/E/S to get the necessary earnings news, which eliminates an additional 28,278 observations. Finally, we delete 2,316 announcements made while the market is open, which leaves us with 51,352 observations. We exclude announcements made during market trading hours because they are such a small percentage of our overall sample (4.3 percent) and in order to create a more-powerful test between a group where good news is strongly predicted (BMO) and a group where bad news is strongly predicted (AMC).[8]

We define two proxies for "good" earnings news. First, *Earnings Surprise* is the difference between the I/B/E/S actual earnings per share and the mean I/B/E/S consensus analyst forecast. We delete *Earnings Surprise* in excess of +/− $1.00 per share. Second, *MBE%* is the percentage of firm observations that meet or beat the mean consensus analyst forecast (from I/B/E/S). *MBE%* provides an alternative measure of good news without respect to magnitude, which avoids skewness issues with *Earnings Surprise*.[9]

Our proxies for the general media/investor attention level discussed for H3 are the size of the firm, the number of analysts covering the firm, and the level of institutional ownership. Our firm-size variable is *MarketCap*, which is defined as the quarter-end market capitalization (in millions) of common equity from Compustat (data item #14 * data item #61). *#Analysts* is the number of analysts providing EPS forecasts for the firm (as reported by I/B/E/S) at the end of the quarter being reported in the earnings announcement. *INST%* is the percentage of common shares held by institutional investors at quarter-end (as reported on SEC Form 13-f).

We begin by presenting descriptive statistics of key variables for the full sample in Table 1, Panel B. Consistent with prior research, our sample firms tend to beat analyst earnings forecasts as the mean (median) quarterly *Earnings Surprise* is $0.0099 ($0.01) per share and the mean *MBE%* is 72.2. The sample mean (median) return on equity (*ROE*) is −0.18 (0.02) per quarter. *ROE* is income before extraordinary items (Compustat data item #8), divided by book value of common equity (data item #60) for the current quarter. Clearly, the large negative mean *ROE* is dominated by a small number of firms reporting large losses as the 1st quartile is 0.00. Although our sample is at the intersection of *Wall*

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[7] To test the accuracy of our sample, we randomly select 100 firms from the full sample and compare the *Wall Street Journal* announcement timestamp with the PR Newswire for Journalists timestamp. The 100 firms yielded 1,078 total quarterly earnings announcements. Of the 1,078 quarterly observations, we were able to match 383 announcement dates (from 50 firms) to an earnings announcement from PR Newswire for Journalists. Of the 383 matched announcement dates we identified 22 errors; five of which have no impact on our results (i.e., the *Wall Street Journal* timestamp was during trading and the PR Newswire for Journalists timestamp was also during trading but at a different time). This results in an accuracy rate for our sample of approximately 95.6 percent.

[8] Bagnoli et al. (2005) report that 27 percent of their sample released earnings during trading hours, with 18 percent being released in the last hour of trading. This is significantly higher than the 4.3 percent we report as being announced during trading hours in our sample. We address this issue by hand collecting from PR Newswire the timestamp for all earnings announcements released during the entire month of July 2006. Of the 1,360 announcements collected, approximately 12 percent were released during trading hours with only 2.13 percent released during the last hour of trading. Consistent with these findings, Battalio and Mendenhall (2007) report in Table 1 that 12.2 percent of their sample (6,176 observations) report earnings during trading hours with less than 1 percent reporting during the last hour of trading.

[9] While our main proxies relate to analyst forecasts, we examine alternative proxies for earnings news (e.g., the level of earnings, the seasonal change in earnings, etc.) in Section IV. Our *Earnings Surprise* variable is on a per share basis, but is not scaled by a firm size variable. This is done to be consistent with prior research. However, we discuss scaled results in Section IV.

Street Journal published earnings announcement times and I/B/E/S earnings forecasts, the sample contains a significant number of both small and large firms. As in many prior studies, the mean market capitalization (*MarketCap*) of $4,595 million is skewed to the right by a few large firms. Median *MarketCap* is $775 million and a quarter of the sample has a *MarketCap* of less than $283 million. The mean (median) level of institutional ownership (*INST%*) is 58.07 (60.43), while the mean (median) number of analysts following the firm (*#Analysts*) is 7.2 (5.0).

Table 2, Panel A categorizes the earnings announcements in our sample by day and time of the report and displays the *Earnings Surprise* and *MBE%* for each group. We can see that the mean *Earnings Surprise* is higher for BMO releases than for AMC releases for every day of the week. The median *Earnings Surprise* is equal between the two groups, except for Friday when it is 0.01 for BMO and 0.00 for AMC. In general, the mean *Earnings Surprise* for Friday appears to be lower than for the other days of the week. These patterns in the pooled data are generally consistent with conventional wisdom and past research that finds that firms report worse earnings news AMC and on Fridays.

The last column of Table 2, Panel A, shows the percent of firms that meet or beat earnings expectations (i.e., firms that report good news). For Monday–Thursday, there appears to be no clear pattern between BMO and AMC. BMO has a slightly higher *MBE%* for Monday, but AMC is slightly higher for Tuesday, Wednesday, and Thursday. On Fridays, the mean *MBE%* is clearly lower than on other days and the Friday AMC of 61.0 is lower than BMO of 65.6. Overall, the *MBE%* column from Table 2, Panel A, does not provide strong evidence that firms generally release bad news AMC rather than BMO. However, it does appear from this pooled data that Fridays have more bad news reports, and that worse news seems to be released AMC on that day.

One additional interesting point about Table 2, Panel A, is the small number of firms that report earnings on Friday. Only 2,222 earnings announcements were made on Friday versus an average of 12,283 on the other days of the week, a reduction of 81.9 percent of the "normal" announcement volume. Furthermore, only 359 earnings announcements were made AMC on Friday versus an average of 6,099 made AMC on the other days of the week. This is a reduction of 94.1 percent of the "normal" AMC announcement volume. One possibility, rather than firms actively selecting to announce bad news on Fridays, is that firms with good news are actively self-selecting out of Friday announcements and especially Friday AMC reporting to avoid the stigma associated with the conventional wisdom surrounding these reporting times.

IV. RESULTS FOR MAIN HYPOTHESES

Replication of Prior Findings: Pooled Results

Panels B and C of Table 2 most closely replicate the tests performed in prior research. Panel B shows the pooled differences for BMO versus AMC firms. Consistent with Patell and Wolfson (1982), we find that BMO announcements have a significantly higher mean *Earnings Surprise* (pooled difference = 0.0034; t-stat = 3.58). However, the *MBE%* for BMO announcements is actually lower at 71.8 versus 72.7 for AMC announcements.

Turning to Panel C of Table 2, results are shown comparing Monday–Thursday announcements versus Friday announcements. In this case, both measures are significantly higher for the expected good-news group. Monday–Thursday announcements have a significantly higher mean *Earnings Surprise* (pooled difference = 0.0076; t-stat = 3.28) and mean *MBE%* (pooled difference = 8.0; t-stat = 7.96). Overall, the picture that emerges from the pooled results in Panels B and C of Table 2 is that, consistent with conventional

TABLE 2
Earnings News by Time and Day for Quarterly Earnings Announcements

Panel A: *Earnings Surprise* and *MBE%* by Time and Day

			Earnings Surprise				
Day	**Time**	**n**	**Mean**	**Q1**	**Median**	**Q3**	***MBE%***
Monday	BMO	2,472	0.0114	−0.01	0.01	0.04	71.2
	AMC	3,797	0.0061	−0.01	0.01	0.03	70.9
Tuesday	BMO	6,577	0.0115	−0.01	0.01	0.03	73.1
	AMC	6,349	0.0084	−0.01	0.01	0.03	73.2
Wednesday	BMO	6,521	0.0116	−0.01	0.01	0.04	72.6
	AMC	7,438	0.0115	−0.01	0.01	0.03	74.3
Thursday	BMO	9,163	0.0127	−0.01	0.01	0.04	71.2
	AMC	6,813	0.0063	−0.01	0.01	0.03	72.1
Friday	BMO	1,863	0.0053	−0.02	0.01	0.04	65.6
	AMC	359	−0.0110	−0.03	0.00	0.03	61.0

Panel B: Pooled Tests of Mean Differences between BMO and AMC

	n	***Earnings Surprise***	***MBE%***
BMO	26,596	0.0115	71.8
AMC	24,756	0.0081	72.7
Pooled Diff.		0.0034	−0.9
t-statistic		3.58**	−2.21**

Panel C: Pooled Tests of Mean Differences between Monday–Thursday and Friday

	n	***Earnings Surprise***	***MBE%***
Mon–Thu	49,130	0.0102	72.5
Friday	2,222	0.0026	64.5
Pooled Diff.		0.0076	8.0
t-statistic		3.28**	7.96**

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*, ** Significant at the 0.05 and 0.01 levels or better, respectively, for a two-tailed t-test of means.

The earnings announcements were collected from the *Wall Street Journal* website from 2000 (the first complete year data is available) through 2005. The website indicates whether the earnings announcement was made before the market opens (BMO), during the market trading hours, or after the market closes (AMC). Announcements made during trading hours have been deleted. The final sample shown above includes those observations that also have I/B/E/S data to calculate *Earnings Surprise* and *MBE%*.

Variable Definitions:

Earnings Surprise = I/B/E/S Actual Earnings − the mean I/B/E/S analyst forecast; we delete *Earnings Surprise* in excess of +/− $1.00 per share; and

MBE% = percentage of firms that meet or beat the mean analyst consensus earnings estimate.

wisdom and past research, relatively worse news does seem to be released after the market closes and especially on Fridays.

Tests of Hypotheses 1 and 2: Analysis of Switching Firms

As stated previously, we use firm-level tests that more clearly examine strategic disclosure behavior, rather than the pooled tests shown in Table 2. In Table 3, we test H1a, which hypothesizes that firms switching to AMC from BMO announce worse earnings news in the current quarter than in the prior quarter (and vice versa). In other words, firms

TABLE 3

Analysis of Mean Differences in Consecutive Quarterly Earnings Surprises for Firms that Switched between BMO and AMC Earnings Announcements

Panel A: Analysis of 1,284 Firms (1,889 Earnings Announcements) that Switched to AMC from BMO

Variable	Current Quarter (AMC)	Prior Quarter (BMO)	Predicted Difference	Firm-Level Difference	t-statistic
Earnings Surprise	0.0017	0.0050	< 0	−0.0033	−1.02
MBE%	67.3	69.8	< 0	−2.5	−1.86

Panel B: Analysis of 1,186 Firms (1,752 Earnings Announcements) that Switched to BMO from AMC

Variable	Current Quarter (BMO)	Prior Quarter (AMC)	Predicted Difference	Firm-Level Difference	t-statistic
Earnings Surprise	0.0053	0.0059	> 0	−0.0006	−0.17
MBE%	69.3	69.1	> 0	0.2	0.17

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*, ** Significant at the 0.05 and 0.01 levels or better, respectively, for a two-tailed t-test that the mean difference is equal to zero.

The earnings announcements were collected from the *Wall Street Journal* website from 2000 (the first complete year data is available) through 2005. The website indicates whether the earnings announcement was made before the market opens (BMO), during the market trading hours, or after the market closes (AMC). Announcements made during trading hours have been deleted. The final sample shown above includes those observations that also have I/B/E/S data to calculate *Earnings Surprise.*

Variable Definitions:

Earnings Surprise = I/B/E/S Actual Earnings – the mean I/B/E/S analyst forecast; we delete *Earnings Surprise* in excess of +/– $1.00 per share; and

MBE% = percentage of firms that meet or beat the mean analyst consensus earnings estimate.

with bad news are opportunistically switching their reporting timing to take advantage of perceived lower media and/or investor scrutiny. In Panel A, H1a predicts that the current quarter's earnings performance (announced AMC) will be lower than that of the prior quarter. The difference between the current quarter (AMC) and the prior quarter (BMO) is calculated for each available firm, and the mean of the firm-level differences is tested. The combination of eliminating the non-switching firm-quarters and using a matched pair design provides more powerful tests than the tests in Table 2, which include firms that are not acting strategically (non-switchers) and simply tests the difference in the means between the two pools. While both the mean *Earnings Surprise* (firm-level difference = −0.0033) and the mean *MBE%* (firm-level difference = −2.5) are lower, as predicted, the differences are statistically insignificant at the 0.05 level (t-stats = −1.02 and −1.86, respectively).[10] Similarly in Panel B, for firms that switch to BMO from AMC (better news is predicted in the current quarter), the mean *Earnings Surprise* (firm-level difference = −0.0006) is actually lower in the current quarter, but not statistically significant (t-stat = −0.17). The mean *MBE%* (firm-level difference = 0.2) is slightly higher, as predicted, but is not statistically significant (t-stat = 0.17). If the data in Panel A and Panel B are combined (by reversing the direction of the difference in Panel A and creating a predicted positive total difference), then the total firm-level differences are 0.0014 for *Earnings Surprise* and −1.4 for *MBE%* (with t-stats = 0.61 and −1.46, respectively).[11] In sum, we find no significant evidence to support H1a.

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[10] We use two-tailed t-tests throughout the paper, as many of our results are in the opposite direction of our hypotheses. In addition, since we run multiple, independent t-tests of our hypotheses, the significance levels should be adjusted using the Bonferroni method. However, since our results are largely insignificant, any adjustment would not alter the interpretation of the results.

In Table 4, we test H1b, which hypothesizes that firms switching to Friday announcements from Monday–Thursday announcements will report worse earnings news in the current quarter relative to the prior quarter (and vice versa). Like the tests in Table 3, Table 4 uses each firm as its own control. In Panel A, we see that both the mean *Earnings Surprise* (firm-level difference = −0.0030) and mean *MBE%* (firm-level difference = −1.3) are lower, as predicted. However, neither is statistically significant, with t-statistics of −0.83 and −0.80, respectively. A similar pattern emerges in Panel B, which compares firms that switched to Monday–Thursday from Friday (current quarter news should be better). The differences are slightly positive, as predicted, but are again statistically insignificant. Once again, if the data in Panels A and B are combined (by reversing the direction of the difference in Panel A and creating a predicted positive total difference), then the total firm-level differences are 0.0018 for *Earnings Surprise* and 1.5 for *MBE%* (with t-stats = 0.65

TABLE 4
Analysis of Mean Differences in Consecutive Quarterly Earnings Surprises for Firms that Switched between Monday–Thursday and Friday Earnings Releases

Panel A: Analysis of 906 Firms (1,365 Current Earnings Announcements) that Switched to Friday from Monday–Thursday

Variable	Current Quarter (Friday)	Prior Quarter (Mon–Thu)	Predicted Difference	Firm-Level Difference	t-statistic
Earnings Surprise	0.0010	0.0040	< 0	−0.0030	−0.83
MBE%	65.8	67.1	< 0	−1.3	−0.80

Panel B: Analysis of 904 Firms (1,342 Current Earnings Announcements) that Switched to Monday–Thursday from Friday

Variable	Current Quarter (Mon–Thu)	Prior Quarter (Friday)	Predicted Difference	Firm-Level Difference	t-statistic
Earnings Surprise	0.0030	0.0024	> 0	0.0006	0.14
MBE%	67.6	65.9	> 0	1.7	1.05

*, ** Significant at the 0.05 and 0.01 levels or better, respectively, for a two-tailed t-test that the mean difference is equal to zero.

The earnings announcements were collected from the *Wall Street Journal* website from 2000 (the first complete year data is available) through 2005. The website indicates whether the earnings announcement was made before the market opens (BMO), during the market trading hours, or after the market closes (AMC). Announcements made during trading hours have been deleted. The final sample shown above includes those observations that also have I/B/E/S data to calculate *Earnings Surprise.*

Variable Definitions:

Earnings Surprise = I/B/E/S Actual Earnings – the mean I/B/E/S analyst forecast; we delete *Earnings Surprise* in excess of +/− $1.00 per share; and

MBE% = percentage of firms that meet or beat the mean analyst consensus earnings estimate.

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[11] Combining the observations in Panels A and B increases the number of observations used to test our first hypothesis, thereby increasing the power to reject the null hypothesis.

and 1.30, respectively). While the pooled tests in Table 2 seemed to indicate a stronger effect for Monday–Thursday versus Friday than for BMO versus AMC, the results in Table 4 for Monday–Thursday versus Friday seem even weaker than those in Table 3 for BMO versus AMC (although each of the tests in both Tables 3 and 4 are statistically insignificant).

Finally, in Table 5 we expand our focus and examine all quarterly earnings announcements for firms that *switch at least once* between BMO and AMC (Panel A) and Monday–Thursday and Friday (Panel B) during our sample period. For each remaining firm, we calculate the mean earnings news for the hypothesized good quarters (BMO or Monday–Thursday) and the hypothesized bad quarters (AMC or Friday). After taking a firm-specific difference between the predicted good and bad quarters, we once again test the mean differences.

In Panel A of Table 5, we test H2a and find that the *Earnings Surprise* for BMO quarters (0.0046) is actually worse than AMC quarters (0.0063) on average, although this difference is not statistically significant (t-stat = −0.62). The firm-level difference in *MBE%* is positive, as predicted, at 0.5, but is insignificant with a t-statistic of 0.48. Panel B, which tests H2b for Monday–Thursday versus Friday quarters, shows greater differences in the

TABLE 5
Analysis of Mean Differences in Earnings Surprise for "Strategic" Reporters

Panel A: Analysis of 1,404 Firms that Switched between BMO and AMC at Least Once from 2000 to 2005

Variable	BMO Quarters[a]	AMC Quarters[a]	Predicted Difference	Firm-Level Difference	t-statistic
Earnings Surprise	0.0046	0.0063	> 0	−0.0017	−0.62
MBE%	69.5	69.0	> 0	0.5	0.48

Panel B: Analysis of 913 Firms that Switched between Monday–Thursday and Friday at Least Once from 2000 to 2005

Variable	Mon–Thu Quarters[b]	Friday Quarters[b]	Predicted Difference	Firm-Level Difference	t-statistic
Earnings Surprise	0.0065	0.0030	> 0	0.0035	1.03
MBE%	67.8	65.6	> 0	2.2	1.63

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*, ** Significant at the 0.05 and 0.01 levels or better, respectively, for a two-tailed t-test that the mean difference is equal to zero.

[a] The mean number of quarters used per firm for the BMO quarters is 6.8; the mean number of quarters used per firm for the AMC quarters is 7.5.

[b] The mean number of quarters used per firm for the Monday–Thursday quarters is 13.1; the mean number of quarters used per firm for the Friday quarters is 2.1.

The earnings announcements were collected from the *Wall Street Journal* website from 2000 (the first complete year data is available) through 2005. The website indicates whether the earnings announcement was made before the market opens (BMO), during the market trading hours, or after the market closes (AMC). Announcements made during trading hours have been deleted. The final sample shown above includes those observations that also have I/B/E/S data to calculate *Earnings Surprise.*

Variable Definitions:

Earnings Surprise = I/B/E/S Actual Earnings − the mean I/B/E/S analyst forecast; we delete *Earnings Surprise* in excess of +/− $1.00 per share; and

MBE% = percentage of firms that meet or beat the mean analyst consensus earnings estimate.

predicted directions (differences = 0.0035 and 2.2 for *Earnings Surprise* and *MBE%*, respectively), but the differences are still statistically insignificant (t-stats = 1.03 and 1.63 for *Earnings Surprise* and *MBE%*, respectively). Overall, Table 5 provides no evidence to support H2.[12]

Tests of Hypothesis 3: Differential Media and Investor Attention

Although we find no support for the opportunism hypothesis in Tables 3 through 5, H3a and H3b focus our tests further by dividing our sample on the basis of media/investor attention. In Table 6, we run the same tests as in Table 5 but now divide the sample in half (using the median value for each variable) using three different proxies. We include two proxies for media attention; firm size (*LnMktcap*) and the number of analysts following the firm (*#Analysts*). Consistent with arguments made by Shleifer and Vishny (1986), our proxy for investor attention is the level of institutional ownership. If H3a is supported, then firms with less media or investor attention should report a greater difference between the earnings news for BMO and AMC quarters (BMO quarters being more positive).

In Panel A of Table 6, we report the mean firm-level difference for both *Earnings Surprise* and *MBE%* between BMO and AMC quarters for each level (either low or high) of the three proxies. If the opportunism hypothesis is supported (H1a), then the firm-level difference should be positive (BMO quarters > AMC quarters). If H3a is supported, then the effect should be greater for the firms with lower media/investor attention (low coverage group − high coverage group > 0). Consistent with our previous findings, we fail to find any support for H1a. None of the mean firm-level differences is significantly positive. The highest t-statistic for *Earnings Surprise* is 0.34 for large firms, and the highest t-statistic for *MBE%* is 0.82 for firms with high institutional ownership. Furthermore, we find no support for H3a as all comparisons between the low and high coverage groups are insignificant. The largest t-statistics are for the comparison between the low and high analyst coverage groups (0.58 for *Earnings Surprise* and 0.05 for *MBE%*). Interestingly, and contrary to our original prediction in H3a, the stronger effect for firm size and institutional ownership is in the high coverage group (although the differences are statistically insignificant).

In Panel B of Table 6, the tests are repeated, using the comparison between Monday–Thursday and Friday quarters. Once again, we find no support for H1b for the firms with lower visibility. However, for firms with higher media/investor attention, we now find some evidence that worse news is announced on Fridays versus Mondays–Thursdays. The strongest effect is for firms with high analyst coverage. The mean firm-level difference for *Earnings Surprise* is 0.0074, which is statistically significant at 0.05 (t-stat = 1.90). The mean firm-level difference for *MBE%* is 3.4 (t-stat = 1.75). The firm-level differences are also positive for both large firms and firms with high institutional ownership, with the t-statistics ranging from 1.10 to 1.71.

Once again, contrary to H3b, it seems to be that more visible firms are more actively engaging in the strategic timing of earnings news. Although the differences between the

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[12] Given that we generally find insignificant results in our hypotheses tests, we also conduct power analyses of *Earnings Surprise* in Tables 3–5 to provide a level of comfort that our findings are not a result of too few observations. This analysis reveals that we would need a range of 5,818 firms (more than six times the current sample size) in Panel B of Table 5 to 462,847 observations (344 times the current sample size) in Panel B of Table 4 to yield in a significant p-value = 0.01.

TABLE 6
Analysis of the Effect of Media/Investor Coverage on the Timing of Earnings Announcements

Panel A: Analysis of 1,404 Firms that Switched between BMO and AMC at Least Once from 2000 to 2005

		Earnings Surprise		*MBE%*	
Subsample	**Predicted Difference**	**Firm-Level Difference**	**t-statistic**	**Firm-Level Difference**	**t-statistic**
Small Firms	> 0	−0.0045	−1.17	0.0	0.01
Large Firms	> 0	0.0012	0.34	1.0	0.75
Small − Large	> 0	−0.0057	−1.09	−1.0	−0.50
Low *#Analysts*	> 0	−0.0001	−0.02	0.6	0.34
High *#Analysts*	> 0	−0.0032	−1.10	0.5	0.35
Low# − High#	> 0	0.0031	0.58	0.1	0.05
Low *INST%*	> 0	−0.0020	−0.56	−0.1	−0.06
High *INST%*	> 0	−0.0012	−0.33	1.1	0.82
Low% − High%	> 0	−0.0008	−0.15	−1.2	−0.58

Panel B: Analysis of 913 Firms that Switched between Monday–Thursday and Friday at Least Once from 2000 to 2005

		Earnings Surprise		*MBE%*	
Subsample	**Predicted Difference**	**Firm-Level Difference**	**t-statistic**	**Firm-Level Difference**	**t-statistic**
Small Firms	> 0	0.0000	0.00	2.7	1.21
Large Firms	> 0	0.0070	1.63	2.1	1.10
Small − Large	> 0	−0.0070	−1.03	0.6	0.19
Low *#Analysts*	> 0	−0.0003	−0.06	1.4	0.65
High *#Analysts*	> 0	0.0074	1.90*	3.4	1.75
Low# − High#	> 0	−0.0077	−1.13	−2.0	−0.66
Low *INST%*	> 0	−0.0008	−0.16	1.5	0.68
High *INST%*	> 0	0.0078	1.67	3.3	1.71
Low% − High%	> 0	−0.0086	−1.26	−1.8	−0.60

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*, ** Significant at the 0.05 and 0.01 levels or better, respectively, for a two-tailed t-test that the mean difference is equal to zero.

The tests in this table are the same as those shown in Table 5 except for the sample partition on small and large firms (those below and above the median of the log of market value), low and high institutional ownership (those below and above the median of institutional ownership) and low and high analyst following (those below and above the median number of analysts providing quarterly EPS forecasts).

All other variables are defined in Table 5.

two groups are not statistically significant (the most significant t-statistic is −1.26), it is interesting that the effect is larger for the more visible firms in our sample. Instead of firms being able to "get away with" opportunistic disclosure more easily because of lower visibility, it is possible that more visible firms enjoy greater benefits from opportunistic disclosure, despite the potential high costs associated with being in the media and investor spotlight.[13]

Overall, we find no substantive evidence that managers, on average, time earnings announcements in an attempt to hide bad news from the market. Our inability to document market-wide, opportunistic behavior with respect to the timing of earnings announcements is robust to several alternative test specifications, multiple proxies for good or bad earnings news, and the addition of controls for cross-sectional differences in investor/media attention. These results are consistent with managers who base their disclosure strategy *as if they believe* that markets are informationally efficient with respect to the timing of news releases (i.e., managers do not appear to be attempting to "fool" the market). This has implications for investors who may attempt to predict what type of earnings news is forthcoming, based on the timing of the earnings announcement, which is usually announced two to three weeks before the actual announcement. If investors accept the results in our paper, then they would not anticipate either abnormally bad or good news, based solely on the timing of the earnings announcement.

Additional Sensitivity Tests

We perform several specification tests to ensure our results are not driven by certain research design choices. We measure earnings news as the difference between I/B/E/S actual earnings and the mean I/B/E/S analyst forecast, as both a continuous variable (*Earnings Surprise*) and an indicator variable (*MBE%*). Alternatively, we use a seasonal changes model where unexpected earnings are equal to current-quarter I/B/E/S actual earnings less actual earnings in the same quarter in the previous year. For non-I/B/E/S firms, we use a similar seasonal changes model that uses the difference in GAAP earnings rather than I/B/E/S earnings. Finally, we also use the level of the earnings news (*ROE*) for the current quarter. None of these alternative proxies for earnings news yields support for H1–H3.[14]

It is also possible that non-earnings related news is driving the timing decision. For example, sales may be lower or higher than expected, or the firm may have significant write-downs or one-time items that are excluded from earnings and analyst forecasts. In order to capture the entire information environment, we use abnormal stock returns (three-day size-adjusted returns centered on the first day of trading following the earnings announcement) as a measure of good/bad news rather than earnings surprise. The results are consistent with the results reported in Tables 2 through 5. That is, we find no difference in abnormal returns when a firm switches between AMC and BMO or Monday–Thursday and Friday.[15]

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[13] Another item to note from Table 6 is that it does not appear that our sample bias toward larger firms (our sample consists of firms covered by the *Wall Street Journal* and I/B/E/S) is causing our inability to find support for the opportunism hypothesis. Since we find in Table 6 that the opportunistic disclosure effect is generally stronger for larger firms, it is perhaps less of a concern that the smallest firms are excluded from our sample. As a robustness check, we also perform the tests in Table 6 using our Tables 3 and 4 methodology (which compares the earnings news from the current quarter to the prior quarter). These untabulated results are generally consistent with Table 6 (i.e., each of the tests yields statistically insignificant differences).

[14] We also use the difference between I/B/E/S actual earnings per share and the last analyst EPS forecast to better capture the most current earnings expectation and avoid stale analyst forecasts (O'Brien 1988). Our results are also robust to sensitivity tests that define all of these alternative earnings news proxies as indicator variables, rather than continuous variables.

[15] We avoid using stock returns as our primary measure of good/bad news because, as Bagnoli et al. (2005) point out, there are questions as to *when* the market impounds the impact of the timing of the earnings announcement. In addition, we are trying to create a measure of good/bad news that is known to management *before* they decide on an earnings announcement date and time.

To be consistent with past research we define the earnings surprise as a per share amount. However, to properly control for heteroscedasticity we also perform our tests after scaling the per share earnings surprise by the firm's price per share at the end of the current quarter. In these tests, this scaled surprise metric provides even more convincing evidence that the earnings surprise does not affect the timing of earnings announcements. In fact, if we use a scaled surprise proxy, the pooled results in Panels B and C of Table 2 also become insignificant.

Since our tests only examine BMO versus AMC and Monday–Thursday versus Friday in independent tests, we combine the two comparisons to potentially create a more powerful test. The first disclosure type (expected to report good news) consists of those firms that report earnings on *both* Monday–Thursday and BMO. The second disclosure type (expected to report bad news) contains firms reporting on *both* Friday and AMC. It should be noted that switching between these two disclosure types does not occur very often, as we are only able to identify 82 occurrences. Once again, the results under this specification are consistent with the results of our primary tests. The mean firm-level difference (Monday–Thursday BMO less Friday AMC) in *Earnings Surprise* is 0.0099 (t-stat = 0.64), while the mean firm-level difference in *MBE%* is 1.2 (t-stat = 0.20). Clearly, the small sample size in these tests reduces our ability to reject the null hypothesis. However, if firms prefer to take advantage of reduced media and investor attention, then this is the most powerful scenario in which to test the opportunism hypothesis.

Finally, although we find that managers do not engage in opportunistic timing *on average*, there are at least *some* managers who seem to follow this pattern. We use this subset of potential opportunistic reporters to examine the differential market responses (ERCs) to their switching behavior. If this group is able to "fool" the market, then we should see a market benefit (or less of a penalty), conditional on the timing of the announcement. For example, for firms with similar earnings news (e.g., they all have worse news in the current quarter than the previous quarter) we separate them into two groups. The first group has switched from BMO to AMC (the opportunistic group), while the second group has not switched to AMC in the current quarter. If the group that has switched to AMC is able to fool the market, then their ERCs should be lower (indicating a smaller penalty for the bad news). We find no evidence that these switching firms are able to fool the market (i.e., the ERCs between the two groups are not significantly different). This result is similar for firms switching to BMO, Fridays, and Monday–Thursday. In fact, not only is there no benefit, but the coefficients for the four tests are directionally consistent with a possible penalty being imposed by the market for opportunistic reporters (although the only statistically significant coefficient is for firms that switch to Fridays). This result helps explain why we find that managers, on average, choose not to engage in opportunistic disclosure with respect to good/bad earnings news. Their apparent belief that markets are informationally efficient with respect to announcement timing is borne out by our limited market response tests.

V. DETERMINANTS OF EARNINGS ANNOUNCEMENT TIMING DECISIONS

Exploratory Identification of Other Determinants

Given that we find little evidence of opportunistic behavior driven by anticipated earnings news for firms that actively changed the timing of their quarterly earnings announcements, it appears that the pooled, cross-sectional results in Table 2 (lower earnings for firms that report AMC and on Fridays) are driven by "consistent" reporters that did not change the timing of their earnings announcements from 2000 through 2005. Hence, we now change our focus and attempt to identify firm characteristics for "consistent" reporters that help explain the earnings announcement timing decision. Note that this part of the paper is somewhat exploratory, as prior research has not attempted to empirically identify the determinants of earnings announcement timing. Another caveat is that we are unable to perform an analysis of "consistent" reporters for the Monday–Thursday versus Friday announcements as there are only two firms that consistently reported earnings on Friday.[16]

As noted previously, Patell and Wolfson (1982) suggest that some firms might announce earnings after the market closes in order to give the market more time to assimilate the news before trading resumes. This idea is illustrated by Warren Buffett's statement in his 2000 letter to Berkshire Hathaway shareholders:

> For us, fair reporting means getting information to our 300,000 "partners" simultaneously, or as close to that mark as possible. We therefore put our annual and quarterly financials on the Internet between the close of the market on a Friday and the following morning. By our doing that, shareholders and other interested investors have timely access to these important releases and *also have a reasonable amount of time to digest the information they include before the markets open on Monday.* (emphasis added)

Patell and Wolfson (1982) conjecture that one possible reason behind their empirical findings (the tendency of AMC firms to report worse earnings) is that firms with less favorable news might want to give the markets more time to assimilate the bad news.

Another characteristic of firms that might lead them to desire additional assimilation time is the complexity of their financial results and operations. It seems reasonable that a firm that generally discloses more complex information may want to give market participants more time to digest the information. Our two proxies for complexity include the annual standard deviation of operating cash flows (Compustat #308) over the past five years and the log of the total number of operating and geographic segments (Compustat Segments file) of the firm. We expect each of these variables to be positively associated with the probability of reporting AMC.

We next examine the effect that the location of the firm's headquarters has on the decision to report BMO or AMC. If a firm is located on the East Coast and is conducting business before the market opens (9:30am), then we would expect to see a higher likelihood of reporting BMO. On the other hand, if a firm is located on the West Coast and the corporate headquarters does not open until after the market is open, then we would expect to see a preference for reporting earnings AMC. We classify, by time zone, each observation in our sample using Compustat's principal location (STATE) code. We code *Time Zone* as equal to 1 if the firm is in the Eastern or Central time zone, and 0 if the firm is in the Mountain or Pacific time zone (foreign firms are not used for this comparison). We expect *Time Zone* to be negatively associated with the probability of reporting AMC.

We next include our three variables used in testing H3 (size, analyst coverage, and institutional ownership) that proxy for media and investor attention. It is possible that more visible firms have preferences as to when they report their earnings, although we have no directional predictions. It is also possible that managers acquiesce to the preferences that analysts and/or large institutional investors have regarding the timing of announcements.

Finally, there may exist some "standard" times for reporting earnings, depending on industry membership. As such, *Industry* represents 47 indicator variables identifying each of the Fama and French 48 industry classification codes. We also require that each industry be represented by a minimum of 20 firm-quarter observations. Firms that belong to an industry with fewer than 20 firm-quarter observations are deleted from this analysis.

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[16] This is similar to Bagnoli et al. (2005) who find that only 1.4 percent of their firms consistently report on Friday.

Univariate and Multivariate Results for Determinants

In Table 7, we begin by analyzing the firm characteristics for firms that consistently report earnings either BMO or AMC during our sample period (with a minimum of four quarters per firm). This results in 305 BMO firms and 362 AMC firms. BMO firms have an average of 13.8 earnings announcements from 2000 to 2005 while AMC firms have an average of 12.7 announcements. Consistent with less profitable firms desiring more assimilation time by reporting AMC, *Earnings Surprise* (0.0111 versus 0.0155 for BMO firms) and *ROE* (−0.02 versus 0.01 for BMO firms) are lower for AMC firms. However, the mean *MBE%* is lower for BMO firms (72.8 versus 78.3). These results show how consistent

TABLE 7
Analysis of Firm Characteristics for "Consistent" Reporters

	Firm Reporting Type			
Variable	**BMO Firm (305 Firms[a])**	**AMC Firm (362 Firms[a])**	**Difference in Means**	**t-statistic**
Earnings Surprise	0.0155	0.0111	0.0044	2.28*
MBE%	72.8	78.3	−5.5	−5.99**
ROE	0.01	−0.02	0.03	2.78**
σCFO	0.08	0.13	−0.05	−4.50**
LnSegments	0.61	0.67	−0.06	−1.09
Time Zone	0.83	0.50	0.33	9.93**
LnMktcap	6.90	6.36	0.54	4.19**
#Analysts	7.13	6.98	0.15	0.34
INST%	56.3	52.2	4.1	2.21*

*, ** Significant at the 0.05 and 0.01 levels or better, respectively, for a two-tailed t-test that the two-sample difference in means is equal to zero.

[a] The mean number of quarters per firm for BMO (AMC) announcing firms is 13.8 (12.7).

The earnings announcements were collected from the *Wall Street Journal* website from 2000 (the first complete year data is available) through 2005. The website indicates whether the earnings announcement was made before the market opens (BMO), during the market trading hours, or after the market closes (AMC). A firm is a "consistent" reporter if it always announces earnings BMO or AMC throughout our sample period (with a minimum of four announcements). Announcements made during trading hours have been deleted. The final sample shown above includes those observations that also have I/B/E/S data to calculate *Earnings Surprise*.

Variable Definitions:

Earnings Surprise = I/B/E/S Actual Earnings − the mean I/B/E/S analyst forecast; we delete *Earnings Surprise* in excess of +/− $1.00 per share;
MBE% = percentage of firms that meet or beat the mean analyst consensus earnings estimate;
ROE = income before extraordinary items divided by book value of common equity;
σCFO = standard deviation, over the previous five years, of annual operating cash flows scaled by average annual total assets;
LnSegments = natural log of the total number of reporting segments at quarter end;
Time Zone = 1 if the firm's corporate location is in either the Eastern or Central time zone, and 0 if the location is in the Mountain or Pacific time zone;
LnMktcap = natural log of fiscal quarter-end market capitalization of common equity;
#Analysts = number of analysts following the firm at quarter end; and
INST% = percentage of common shares held by institutional investors at quarter end.

reporters are driving the *Earnings Surprise* pooled results in Table 2, rather than the "strategic" switchers.

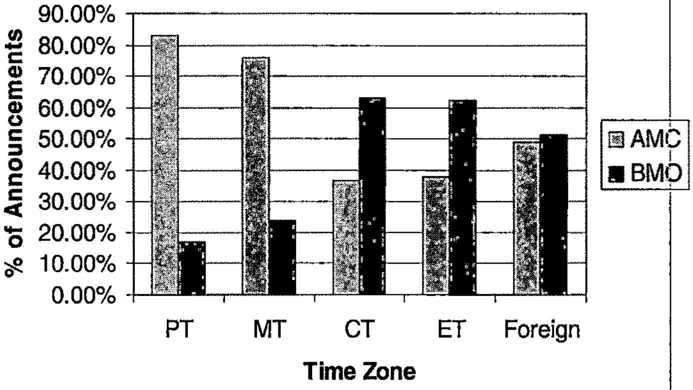
Turning our attention to the other possible determinants of the BMO/AMC decision, we see that the mean of each of the two proxies for complexity is higher for AMC firms, supporting the idea that firms that generally release more complex information prefer to give the market more time to assimilate the news before the market opens the following day. Cash flow volatility is 63 percent higher for AMC firms (0.13 versus 0.08 for BMO firms; t-stat = −4.50). The log of operating and geographic segments, *LnSegments*, is 0.67 for AMC firms and 0.61 for BMO firms (although the difference is statistically insignificant with a t-stat = −1.09).

As predicted, *Time Zone* is much smaller for AMC firms. 83 percent of firms that report BMO have corporate locations in the Eastern or Central time zones, while only 50 percent of firms that report AMC are located in the East (t-stat = 9.93). This strong result is also shown in Figure 1. The results are particularly extreme for firms in the West. Over 80 percent of announcements are made AMC in the Pacific time zone, while over 75 percent in the Mountain time zone are made AMC.

Each of our proxies for media and investor attention are higher for BMO firms. *LnMktcap* is 6.90 for the BMO firms versus 6.36 for AMC firms (t-stat = 4.19). *#Analysts* is 7.13 for BMO firms versus 6.98 for AMC firms, though the difference is not statistically significant (t-stat = 0.34). *INST%* is 56.3 for BMO firms and 52.2 for AMC firms (t-stat = 2.21). On average, it appears that more visible firms have a preference for reporting BMO.[17]

FIGURE 1

The Timing of Earnings Announcements by Location of Corporate Headquarters



The earnings announcements were collected from the *Wall Street Journal* website from 2000 (the first complete year data is available) through 2005. The website indicates whether the earnings announcement was made before the market opens (BMO), during the market trading hours, or after the market closes (AMC). Announcements made during trading hours have been deleted.

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[17] Chambers and Penman (1984) and Kross and Schroeder (1984) document that delayed earnings announcements tend to contain worse news. As a result, we also examine the number of days after the end of the quarter that the earnings announcement is released. We find no significant difference between BMO and AMC firms.

Our analysis of consistent reporters above reveals that while earnings appear to be more positive for BMO firms relative to AMC firms, there are several other significant differences, mostly unrelated to earnings, which may impact the timing of earnings announcements. Clearly, the starkest example of this is the time zone effect. We next analyze these determinants in a multivariate logistic regression. We model the decision to release earnings AMC as follows:

$$\begin{aligned} Prob(AMC_t) = f(&\phi_1 + \phi_2 Earnings\ Surprise_t + \phi_3 \sigma CFO_t + \phi_4 LnSegments_t \\ &+ \phi_5 Time\ Zone_t + \phi_6 LnMktcap_t + \phi_7 \#Analysts_t \\ &+ \phi_8 INST\%_t + \phi_i Industry_t + \kappa_t) \end{aligned} \tag{1}$$

We first perform the analysis using only the consistent reporters and report the results in the first two columns of Table 8. We begin by estimating the decision to report earnings AMC using *Earning Surprise* as the only decision variable. *Earnings Surprise* is negatively correlated (coefficient of -0.554, $\chi^2 = 11.85$) with the likelihood of reporting AMC. That is, the smaller the earnings surprise, the more likely the news is being released after the market closes, which is consistent with both prior research and the results we report in Tables 2 and 7.

Next, we re-estimate the regression with the inclusion of the additional determinants. Interestingly, *Earnings Surprise* now appears to weaken considerably, although it is still significant (the χ^2 falls to 4.39, with a p-value $= 0.036$). Hence, after controlling for other determinants it still appears that firms with lower earnings tend to announce AMC, possibly in order to give market participants more time to digest these lower earnings.

Consistent with the idea that more complex firms tend to give investors more assimilation time, the coefficients for both complexity proxies are positive and significant at less than a 0.01 level. The coefficient on the volatility of past cash flows, σCFO, is 1.420, with a χ^2 of 57.15, while the coefficient on *LnSegments* is 0.094 with a χ^2 of 11.67.

The *Time Zone* variable is again an extremely significant determinant with a coefficient of -0.315 and a χ^2 of 319.02. Note that, while this result may seem rather obvious, previous research (Patell and Wolfson 1982) found no differences between East Coast and West Coast firms in their sample.

Among our three proxies for media and investor coverage, firm size (*LnMktcap*) is still a significantly negative predictor of reporting AMC. It is clear that smaller firms tend to report earnings AMC, possibly to give their results more attention in a crowded earnings calendar. Interestingly, *#Analysts* has switched signs from the univariate analysis and is now significantly positive (coefficient of 0.029 and a $\chi^2 = 45.78$). This strong result indicates that, after controlling for firm size, firms with more analysts tend to report AMC. Finally, the χ^2 for *INST%* is almost exactly zero, indicating no tendency toward BMO or AMC reporting for differing institutional ownership levels. Also included in the multivariate logistic regression are 40 industry indicator variables. Of these, 27 are significant with a p-value < 0.05, lending support to the idea that there is quite a bit of industry clustering occurring in the earnings announcement timing decision.

For completeness, we next estimate the logistic regression using only "switchers" and report the results in the "Switchers" columns (columns 4 and 5) of Table 8. Although our independent variables are long-term, fundamental characteristics of the firm, it is possible that much of the variation in the "switchers" disclosure timing decision is also driven by

TABLE 8
Logistic Regression of the Decision to Release Earnings BMO or AMC for Firms Principally Located in the U.S.

$$Prob(AMC_t) = f(\phi_1 + \phi_2 Earnings\ Surprise_t + \phi_3 \sigma CFO_t + \phi_4 LnSegments_t + \phi_5 Time\ Zone_t + \phi_6 LnMktcap_t + \phi_7 \#Analysts_t + \phi_8 INST\%_t + \phi_i Industry_t + \kappa_t) \quad (1)$$

	Consistent Reporters (n = 8,028)		Switchers (n = 22,965)	
Variable	**Coefficient Estimate (χ^2-statistic)**	**Coefficient Estimate^a (χ^2-statistic)**	**Coefficient Estimate (χ^2-statistic)**	**Coefficient Estimate^a (χ^2-statistic)**
Intercept	0.090 (40.70)**	−10.417 (0.00)	−0.079 (90.29)**	3.955 (0.88)
Earnings Surprise	−0.554 (11.85)**	−0.408 (4.39)*	−0.274 (12.25)**	−0.112 (1.89)
σCFO		1.420 (57.15)**		0.292 (13.15)**
LnSegments		0.094 (11.67)**		−0.009 (0.43)
Time Zone		−0.315 (319.02)**		−0.079 (80.01)**
LnMktcap		−0.134 (63.03)**		−0.125 (216.37)**
#Analysts		0.029 (45.78)**		0.013 (37.31)**
INST%		0.000 (0.00)		0.134 (11.58)**

*, ** Significant at the 0.05 and 0.01 levels or better, respectively.

[a] Industry indicator variables are included, but not presented due to lack of space. In the logistic regression for the consistent reporters, 27 of the 40 included industry indicator variables are significant with a p-value less than 0.05. In the logistic regression for the switching reporters, 18 of the 46 included industry indicator variables are significant with a p-value less than 0.05.

AMC is equal to 1 if the firm announced current-quarter earnings after the market closed, and 0 if the firm announced earnings before the market opened (BMO).

Variable Definitions:

Earnings Surprise = I/B/E/S Actual Earnings – the mean I/B/E/S analyst forecast; we delete *Earnings Surprise* in excess of +/− \$1.00 per share;
σCFO = standard deviation, over the previous five years, of annual operating cash flows scaled by average annual total assets;
LnSegments = natural log of the total number of reporting segments at quarter end;
Time Zone = 1 if the firm's corporate location is in either the Eastern or Central time zone, and 0 if the location is in the Mountain or Pacific time zone;
LnMktcap = natural log of fiscal quarter-end market capitalization of common equity;
#Analysts = number of analysts following the firm at quarter end; and
INST% = percentage of common shares held by institutional investors at quarter end.

Industry represents 47 indicator variables identifying each of the Fama and French 48 industry classification codes. If an industry group has less than 20 observations, those observations are deleted.

longer-term considerations, with other (as yet unidentified) variables driving the switching behavior at the margin. We begin by estimating the decision to report earnings AMC using *Earning Surprise* as the only decision variable. *Earnings Surprise* is negatively correlated (coefficient of −0.274, $\chi^2 = 12.25$) with the likelihood of reporting AMC.[18] When we include the additional explanatory variables, the coefficient on *Earnings Surprise* becomes insignificant. This result further bolsters the idea that switching firms do not switch based on the type of news to be reported. Other less opportunistic reasons seem to exist for the switching firms' reporting behavior.

The other variables are fairly consistent with those reported for the consistent reporters, with the exception of *LnSegments* and *INST%*. The coefficient on *LnSegments* is now negative, but statistically insignificant (coefficient of −0.009, $\chi^2 = 0.43$). The coefficient on *INST%* is now significantly positive (coefficient of 0.134, $\chi^2 = 11.58$) and is now in the same direction as *#Analysts*. Since AMC switching firms are more likely to have more analysts and more institutional investors, it really seems unlikely that they would be reporting bad earnings news AMC in order to hide the information from the public.

Overall, the results in this section indicate that several other factors besides earnings news contribute to the earnings announcement timing decision. First, it is clear that firms that *consistently* report their earnings BMO or AMC are driving the pooled results that show that AMC reporters announce worse earnings news (first reported by Patell and Wolfson [1982], and replicated in our Table 2). When limiting the analysis to switching firms and controlling for our other determinants of the timing decision, the level of earnings news is an insignificant explanatory variable. Thus, our results highlight the importance of identifying firms as either consistent reporters or switchers and including other variables besides the level of earnings news.

Next, we find support for the time zone hypothesis and industry clustering. AMC firms are much likelier to be located in the West, while BMO firms tend to be located in the East. Over half of our industry indicator variables are significant in explaining the BMO/AMC decision for consistent reporters. We also find that AMC firms tend to be smaller and have relatively more analyst coverage.

Finally, we find some support for the assimilation hypothesis. Firms that consistently report AMC are characterized by having lower earnings and more complexity, which may lead managers to give the market more digestion time for their results. In addition, if the assimilation hypothesis is descriptive of managerial behavior, and if managers are successful at more broadly disseminating information, then we should be able to observe differential market consequences based on the timing of the announcement. In final tests we examine the abnormal trading volume around the earnings announcements. If AMC announcements are chosen to more broadly disseminate the information, then we expect that they will be accompanied by an increase in abnormal trading volume. As Figure 2 demonstrates, in a pooled test we do find higher abnormal volume around the AMC earnings announcements.[19] We also perform within-firm tests of abnormal volume (not tabulated) for firms that switch between AMC and BMO (similar to the earnings news tests in Tables 3–5). Consistent with Figure 2, we find a significant increase (decrease) in abnormal trading volume when a firm switches from BMO to AMC (AMC to BMO). Together, one could interpret these results

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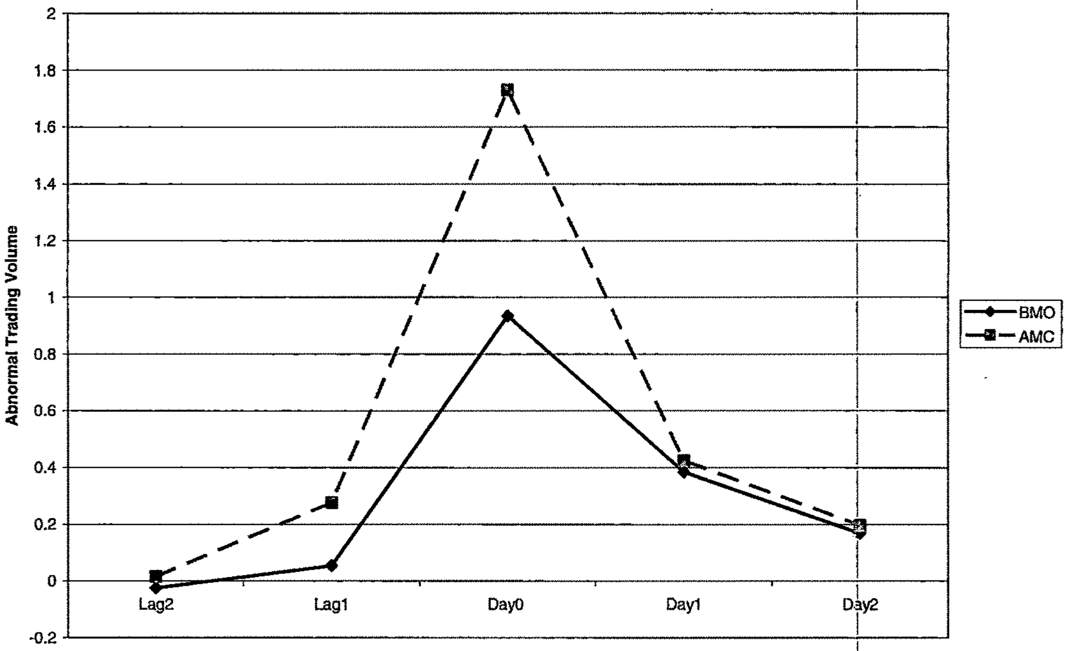
[18] Note that this pooled result differs from our more powerful tests related specifically to the effect of earnings news in Tables 3–6, which take advantage of the use of firm-level differences in a matched pairs approach. Thus, this result should not be interpreted as supporting the opportunistic disclosure hypothesis.

[19] For variable definitions and test details, see the accompanying text for Figure 2. The difference in abnormal trading volume between AMC and BMO on Day0 in Figure 2 is significant at $p < 0.001$ (t-stat = 26.27). The difference in cumulative abnormal trading volume between AMC and BMO over the entire 5-day period is significant at $p < 0.001$ (t-stat = 15.11). Our abnormal trading volume result is consistent with Pronk (2006), who finds that bid-ask spreads are smaller and trading depths are larger for overnight earnings announcements relative to daytime announcements.

FIGURE 2
Abnormal Trading Volume for All Firm-Quarters by AMC and BMO for the Five Days Surrounding the Earnings Announcement



The earnings announcements were collected from the *Wall Street Journal* website from 2000 (the first complete year data is available) through 2005. The website indicates whether the earnings announcement was made before the market opens (BMO), during the market trading hours, or after the market closes (AMC). Announcements made during trading hours have been deleted. Abnormal trading volume is defined as the difference between each firm's percentage of shares traded on day *t* and that firm's average percentage of shares traded during the calendar month prior to month of the earnings announcement. Day0 is defined as the first day of trading after the earnings announcement is released. For example, if a firm reports earnings on Wednesday BMO, then Day0 is Wednesday. If a firm reports earnings AMC on Thursday, then Day0 is Friday, Day1 is the following Monday, etc. We use all firm-quarter observations (approximately 50,000) for which abnormal trading volume is available in Figure 2. We find similar results for both the (1) firms that consistently report their earnings AMC or BMO and (2) firms that switch their announcements between AMC and BMO. Note that the switching firm tests are similar to those shown for Tables 3–5 (i.e., they are firm-level tests, which reduces the need for other control variables).

as evidence that firms that release earnings AMC are successful at disseminating the news to a broader audience (i.e., more traders are able to participate in the earnings announcement event), although other interpretations are also possible.

VI. SUMMARY AND CONCLUSION

We examine the conventional wisdom that managers opportunistically choose to report worse earnings news after the market closes and/or on Fridays. Rather than using pooled, cross-sectional tests as in prior research, we focus on firm-level tests that examine firms that switch between reporting times and days. It is these "switchers" that would seem to be strategically timing their disclosures. We also extend prior research by identifying differences in characteristics between firms that consistently report before the market opens (BMO) and firms that consistently report after the market closes (AMC).

In firm-level tests, we find no evidence that firms that switch their earnings announcements between BMO and AMC or Monday–Thursday and Friday report significantly worse earnings AMC or on Fridays. In addition, after partitioning the sample based on the level of media and investor attention (firm size, analyst coverage, and institutional ownership) we still find little or no support for the idea that firms are opportunistically timing their earnings announcements based on the earnings news being reported.

Given that we find little or no evidence that "switching" firms are opportunistically timing their earnings announcements due to the type of earnings news, we next turn our attention to identifying other determinants of the earnings announcement timing decision. We find some evidence that firms needing more assimilation time for their earnings announcements (e.g., firms that are more complex) tend to announce AMC. We also find that the most significant explanatory variable is corporate location. Firms in the Eastern and Central time zones are much more likely to announce earnings BMO than their western counterparts. Finally, we also find that firm size, analyst coverage, and industry membership are significant variables in explaining the timing of earnings announcements.

In sum, our results shed light on the reasons behind the empirical regularity that AMC and Friday earnings announcements tend to contain relatively worse news. Rather than being a result of managers trying to "fool" the market by hiding bad news, our results are indicative of more benign managerial motives and institutional factors. Hence, our findings are consistent with efficient capital markets that are effective at monitoring new information, regardless of the time of the announcement.

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Why Do Cities Hoard Cash? Determinants and Implications of Municipal Cash Holdings

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ABSTRACT: This study examines the determinants of municipal cash holdings and the implications of holding high levels of cash. The first part of the analysis investigates municipal manager incentives to accumulate cash as part of normal operations. Results indicate that municipalities with a higher variation in revenues, fewer sources of revenues, and higher growth accumulate more cash. Larger governments and those receiving relatively more state revenue accumulate less cash. Further analysis considers whether high levels of cash indicate agency problems, and finds municipalities with high cash holdings spend more on administrative expenses, city manager salaries, and bonuses. I find no evidence that municipalities with excess cash reduce taxes. The presence of staggered councils and councils that are not independent tend to exacerbate excessive cash holdings. These results are consistent with the proposition that municipalities with high cash levels have agency problems relative to those with lower cash holdings.

Keywords: *local government; cash holdings; efficiency; compensation; governance.*

Data Availability: *Data are available from public sources.*

I. INTRODUCTION

Municipalities frequently use "rainy day" funds, where cities save money during good economic times and spend it in the future during economic downturns. In so doing, municipalities can provide a constant level of services to citizens, regardless of revenue volatility. Rainy day funds are therefore typically considered prudent financial management. At the same time, a growing literature on corporate cash holdings

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suggests that large cash build-ups indicate self-interested managerial behavior, such as engaging in value-decreasing mergers (Jensen and Meckling 1976; Blanchard et al. 1994; Harford 1999) and consuming perquisites (Jensen 1986).

Municipalities similarly can accumulate large cash reserves. The State of Illinois documents that over one quarter of all Illinois towns (379) hold funds greater than two years' annual expenditures (Illinois Comptroller's Office 2002).[1] In other words, these towns could operate at normal spending levels for two years without collecting additional revenue. To put this ratio in perspective, bond-rating agencies recommend that governments maintain a balance of 5–10 percent of operating expenditures, or approximately one month, with 2.4 months cited as evidence of a strong financial position (Standard & Poor's 1999).

This raises issues largely unexplored in the literature. As examples, how much cash do local governments typically hold, and are there operational reasons for accumulating cash? Do high cash levels indicate self-interested managerial behavior or prudent financial management in the municipal context? This study addresses these questions.

Initial analysis examines the determinants of expected cash holdings to understand municipal managers' incentives to accumulate cash. Expected cash holdings are estimated as the benchmark level of cash accumulated in the absence of agency problems, or actions that benefit managers at the expense of citizens. The evidence is consistent with the notion that managers hold cash for precautionary and operational reasons. Specifically, I find that governments with relatively high variation in revenues, fewer sources of revenues, and high growth are more likely to accumulate cash, while larger governments and those receiving more state revenue are less likely to accumulate cash holdings.

While municipal managers have incentives to hold cash for operational reasons, it is also plausible that high cash levels exacerbate agency problems between managers and citizens. For example, high levels of cash can free managers from the discipline of requesting voter approval for unpopular projects or programs. Thus, the second part of the study investigates whether high cash holdings are associated with evidence of agency problems. Specifically, I test whether municipalities with high cash reserves have higher spending on administrative overhead expenses, higher manager salaries and bonuses, and distribution of excess cash to citizens through tax reductions.

Following prior literature such as Opler et al. (1999), high cash holdings (or "excess cash") are measured as the residuals from a regression specification of expected cash holdings. Results indicate that governments with excess cash spend relatively more on administrative expenses, manager salaries, and bonuses, and do not return excess cash to citizens in the form of tax reductions.

Additional analysis examines governance characteristics associated with cash holdings. This analysis reveals that entrenched managers are associated with higher cash levels. Specifically, municipalities carry more cash when board (council) elections are staggered and the council is not independent (i.e., the chief elected official either sits on the council or votes on the council). Overall, the implication is that governments with high cash levels appear to have agency problems relative to those with lower cash reserves.

My study contributes to the literature in several ways. First, I document the prevalence, determinants, and agency implications associated with accumulating cash holdings in a governmental setting. Such relations are not examined previously, although two prior studies explore cash reserves (or "endowments") in nonprofit entities. Fisman and Hubbard (2005), who focus on determinants of nonprofit endowments, find that nonprofit managers accumulate cash for precautionary reasons, such as to shield against revenue volatility. Core et al. (2006) explore whether excess cash leads to agency problems between nonprofit managers and donors, and find that nonprofits with large endowments pay managers higher salaries and spend less on programs, consistent with agency concerns.

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[1] Note that I use the terms "funds" and "cash" interchangeably throughout the study.

The governmental setting differs fundamentally from both the corporate and nonprofit sectors, and therefore, results of studies in other contexts may not apply to governments. For example, agency problems in municipalities are likely greater than those exhibited in nonprofits because the monitoring environment is relatively weak. Citizens are not typically strong monitors over municipal finances (Zimmerman 1977), and lenders (considered among the strongest municipal monitors) lack incentives to encourage the reduction of cash holdings (Gore 2004). In contrast, nonprofits are often monitored by large donors, who encourage the expenditure of excess cash, as suggested by Core et al. (2006). Agency problems are also likely greater in municipalities because they have the power to tax citizens to raise revenues. In contrast, nonprofits collect revenue through donors and granting agencies, both of which can choose to withhold funds if problems are evident.

In other respects, municipalities are likely to exhibit fewer agency concerns than those of nonprofits. For instance, government managers can return excess cash to citizens in the form of tax reductions or rebates, which reduces agency issues. Anecdotal evidence suggests that some governments (e.g., Alaska and Oregon) return surplus funds to citizens. In contrast, the nonprofit sector is characterized by an inability to return cash to donors.

Finally, the nature of the political setting renders the governmental sector unique from both the nonprofit and corporate settings. Namely, municipal officials face competitive elections at regular intervals that can impact municipal cash holdings. On one hand, competitive elections encourage elected officials to act in voters' best interests—that is, to avoid accumulating excess cash, and to spend cash prudently (e.g., through more efficient operations). On the other hand, if elections are not competitive and incumbents are entrenched, then cash build-ups and/or agency problems can occur. Thus, *ex ante*, the consequences of holding high cash levels in a municipal setting are not obvious.

Similar to Fisman and Hubbard (2005), I document determinants of cash holdings in a noncorporate setting, and like Core et al. (2006), I investigate the agency implications of such holdings. In contrast with both Fisman and Hubbard (2005) and Core et al. (2006), I examine whether noncorporate managers reduce cash holdings by returning it to taxpayers. In further contrast with both studies, and in an extension of the municipal literature in general, I investigate whether excess cash holdings are associated with manager entrenchment characteristics. Such governance traits are not previously explored in the municipal literature.

The study also contributes to the governmental accounting literature in general, with implications for public policy beyond those with respect to cash holdings. For example, the study is the first to explore issues associated with municipal manager compensation or municipal efficiency. Such research is important for evaluating managers' stewardship over citizens' resources. The stewardship function is considered of primary importance in the municipal sector and one of the main reasons for governmental accounting standards (GASB 2006). Thus, research about municipal managers' stewardship over compensation and efficiency should interest policy-makers.

The results also have implications for recent policy debates about governmental rainy day funds. While state regulators often monitor financial shortfalls caused by fiscal distress, fewer appear to monitor the accumulation of excess funds. Citizens are similarly unlikely to monitor excess cash holdings. Most citizens have difficulty assessing municipal finances due to the complexity and availability of government financial reports, thus reducing their effectiveness as monitors (Zimmerman 1977). The evidence presented here suggests that in addition to setting minimum cash reserve balances to prevent fiscal distress, municipalities should also consider setting maximum balances to avoid potential agency problems.

The remainder of the study is organized as follows. Section II examines determinants of expected cash holdings, absent agency concerns. Section III explores the agency implications of excess cash holdings. Section IV investigates the relation between manager entrenchment and cash holdings, while Section V concludes.

II. DETERMINANTS OF EXPECTED CASH HOLDINGS

Theory

In this section, I develop a benchmark for estimating expected municipal cash holdings based on strategic and economic reasons for maintaining cash balances. I hypothesize that the following factors are associated with managers' incentives to maintain efficient cash balances as part of normal operations.

Uncertainty of Cash Flows

Fisman and Hubbard (2005) model nonprofit endowment as a function of precautionary savings, showing a positive relation between the volatility of donation revenue and cash holdings. Similarly, when municipalities have volatile revenue sources, managers are likely to increase cash holdings in order to maintain a constant level of services. I therefore expect revenue volatility to be positively associated with cash reserves. Following Fisman and Hubbard (2005) and Core et al. (2006), I use the coefficient of variation to capture revenue uncertainty.

Access to Credit Markets

The relation between access to credit markets and cash holdings in the municipal sector is not straightforward. On one hand, municipalities can reduce the amount of precautionary cash holdings by borrowing from credit markets. Opler et al. (1999) suggest that raising external funds can be costly due to high transactions costs, so entities with more limited access to capital markets use cash holdings as a buffer. Core et al. (2006) and Fisman and Hubbard (2005) find that nonprofits maintain higher cash levels when firms have limited financing sources. If this logic applies, then municipalities with high transactions costs or limited access to credit markets will hold higher cash levels, which implies a negative relation between credit market access and cash holdings.[2]

On the other hand, the municipal sector is unique in that bankruptcy is rare, which limits investors' risk of default. Moreover, municipalities can borrow at a tax-free rate because most municipal bonds are not taxable. Municipalities are therefore unlikely to experience limited access to credit markets in the same sense as either corporations or nonprofit entities. The relatively low cost of capital, coupled with the opportunity to earn a higher rate on investments than the rate at which they borrow, potentially encourages cash accumulation.[3] This implies a positive relation between cash holdings and credit market access.

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[2] Recent events suggest that municipalities can experience difficulty accessing credit markets. In particular, municipalities with lower bond ratings that historically relied on bond insurance to reduce debt costs are having trouble underwriting projects. Because bond insurers now face large write-downs to cover losses in the mortgage industry, some have stopped insuring new municipal projects for lower-rated municipalities (Cho 2007).

Core et al. (2006) and Fisman and Hubbard (2005) measure nonprofits' access to credit markets as a dummy variable equal to 1 if debt is issued in the prior ten years. While nonprofit debt issuance is relatively rare, municipalities make much greater use of the credit markets. I therefore define this variable following Opler et al. (1999) and include total debt per capita to represent access to credit markets.[4]

Limited Revenue Sources

When municipalities have access to a variety of revenue sources, they can raise funds relatively more quickly, and are less susceptible to adverse revenue shocks. Conversely, when revenues are concentrated in fewer sources, such as a high reliance upon property taxes, then municipalities are more likely to maintain higher cash reserves. I therefore expect a positive relation between limited revenue sources and cash holdings. Following Copeland and Ingram (1982), I measure limited revenue sources using a revenue diversification index.[5] The index is computed as the product of the fraction of total revenue from each source, or $(r_1/R)(r_2/R),\ldots,(r_N/R)$, where r is the amount of revenue received from a specific source, and R is total revenue. The more unbalanced the revenue sources, the higher the index value.

Size

Larger organizations have economies of scale in liquid assets such that large firms can hold relatively less cash, as discussed by Opler et al. (1999). Consistent with this hypothesis, Opler et al. (1999) and Core et al. (2006) find size varies inversely with cash reserves. Following prior municipal literature, I control for municipal size using the log of population.

Growth

Growing municipalities have incentives to save cash in anticipation of future spending on capital projects such as infrastructure expansion. I measure growth as the change in population over the preceding five years, following Baber and Gore (2008).

State Revenue

Increased levels of state monitoring potentially affect cash holdings. Specifically, municipalities holding high cash levels are less likely to receive funding from state resources. Following prior literature, I define the influence of state revenue as the percentage of state revenue received, or total state revenue received/total revenue, and expect an inverse relation with cash holdings.

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[3] Note that municipal arbitrage, or the ability to borrow at a tax-free rate while investing at a higher, "taxable" rate, is allowed under some limited circumstances. The 1986 tax law limits the ability of municipalities to invest specific bond proceeds into investment vehicles that earn rates higher than those incurred through the associated debt. However, fund accounting methods effectively enable municipalities to hold high cash levels in one fund, and invest them at higher rates, while staying within the IRS regulations for bonds issued in another fund. It is therefore plausible that municipalities earn higher rates of interest than they pay out on debt, encouraging an accumulation of cash.

[4] An alternate specification uses the log of debt per capita with consistent results.

[5] I use two alternate specifications of limited revenue sources (untabulated). The first measures revenue sources directly by including separate measures for the percentage of revenue derived from property taxes, sales taxes, and income taxes. The second includes an indicator variable equal to 1 if revenue from any one source is above the sample median for that state. Results for both specifications are consistent with those reported.

Specification

I use the following OLS model to measure the determinants of expected municipal cash holdings:

$$\begin{aligned} \mathit{Cash/Expenditures}_{it} = {} & \alpha_0 + \alpha_1 \mathit{CV\ revenue}_{it} + \alpha_2 \mathit{Debt\ per\ capita}_{it-1} \\ & + \alpha_3 \mathit{Limited\ revenue} + \alpha_4 \mathit{Size}_{it} + \alpha_5 \mathit{Growth}_{it} \\ & + \alpha_6 \mathit{State\ revenue}_{it} + \Sigma\alpha_k \mathit{Quarter}_k \\ & + \Sigma\alpha_m \mathit{State}_m + \Sigma\alpha_t \mathit{Year}_t \end{aligned} \tag{1}$$

where:

Cash/Expenditures = ratio of cash and cash equivalents to monthly operating and interest expenditures;
CV Revenue = coefficient of variation of revenue, defined as the ratio of the standard deviation of revenue to mean revenue, measured over the previous four years;
Debt per capita = total debt/total population;
Limited revenue = revenue diversification index, or $(r_1/R)(r_2/R),\ldots,(r_N/R)$, where r is the amount of revenue received from a specific source, and R is total revenue;
Size = log of total population;
Growth = change in population from year $t-5$ to t, deflated by population in year $t-5$;
State revenue = the total state revenue received/total revenue;
Quarter = a series of dummy variables indicating the quarter of the fiscal year-end;
State = dummy variable indicating the state; and
Year = dummy variable indicating the year.

Cash is computed as total cash and marketable securities, deflated by total expenditures per month, which includes operating and interest expenditures.[6] Note that I exclude cash reserves within pension plans, as I assume they are not available to spend.[7] On the other hand, I include cash held in bond funds (other than sinking funds), because such holdings are often not legally restricted. To the extent that such cash holdings are restricted in a particular state, then the inclusion of state indicator variables controls for the mean effect of such restrictions. In additional tests (not reported), I estimate a specification that excludes bond fund cash, and find results consistent with those reported, with the exception of debt per capita, which is no longer statistically significant.

An alternate measure of available funds encompasses measuring fund balance (or fund equity) in place of cash holdings. However, Fisman and Hubbard (2005) find virtually identical results when fund equity (i.e., total assets less total liabilities) is used. One concern with using fund balance is the issue of restricted funds, which may not be available to spend. Core et al. (2006) find stronger results—that is, coefficients of larger magnitude—when the sample is constrained to unrestricted funds. In order to partially address this concern, I exclude cash holdings that are legally restricted to service future debt (sinking funds), which are likely to be the largest source of restricted fund equity. Data constraints prohibit further analysis because the fund equity amounts are not available from the Census database. Note that a detailed description for all Census data items used in my tests is presented in Table 1.

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[6] Using the logarithm of cash/expenditures yields results consistent with those reported.

[7] Anecdotal evidence indicates that local governments may be able to expend pension funds. See http://www.cafrman.com for further details about the availability of pension fund cash.

Following prior literature, I measure cash at the end of each fiscal year. If governments tend to collect large amounts of cash at the end of the fiscal year, however, then it may appear that they have excess cash, when in fact, they have a timing issue. For example, if property taxes are collected close to year-end, and governments are highly reliant on these revenues, then they may have a high level of cash at year-end. I control for this possibility by including an indicator variable to distinguish the government's quarter of fiscal year-end.[8] In addition, many governments collect property taxes over a period of time, thus negating this concern.

Other state-specific effects potentially affect cash holdings. For instance, local governments in states with closer monitoring over municipal finances in general may carry lower cash balances. Moreover, states can vary on dimensions of the economy or the extent of regulations. I therefore include a series of indicator variables to distinguish municipalities by state. Finally, I incorporate yearly fixed effects.

Sample Selection and Descriptive Statistics

Data are from the 1997–2003 Census Bureau's Annual Survey of Governments for all cities, towns, boroughs, and villages in the database. Note that the sample period ends in 2003 because the Census data are merged with other databases that are available only through 2003. The Census contains details for all "income statement" accounts, including revenues, expenditures, and transfers. The Census also provides "balance sheet" data such as cash and debt. I eliminate 4,043 observations with missing data for cash or operating expenses, and 57 observations with apparent errors such as negative debt. A total of 66,612 observations without four years' consecutive data, the minimum number of observations necessary to estimate the regression models, are also deleted. The sample selection procedures, outlined in Table 2, yield 9,413 observations.

Descriptive statistics are presented in Table 3. Using the full population of municipalities, Panel A shows mean and median cash flows deflated by monthly operating and interest expenditures for each year. Note that deflating cash by monthly expenditures represents the number of months governments can operate without collecting revenue. I present statistics for the full population, rather than for the subset used in subsequent tests, because the tests require municipalities to be present for four consecutive years, which substantially reduces the sample size. Overall, cities and towns carry a median of 9.3 months of expenditures in cash, and a mean of 12.8 months. In addition, yearly trend data show that median cash levels are fairly constant across years. The number of observations fluctuates in some years because Census reporting is only required every five years (i.e., 1997 and 2002), and is voluntary in the remaining years.

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[8] The measure of limited revenue sources is also likely to control for this effect. In further tests, I substitute the ratio of property taxes/total revenues as an additional control (not tabulated), and find results consistent with those presented. Further, untabulated descriptive statistics show that, on average, only 17 percent of all municipalities derive more than 50 percent of their total revenue from any one source (property taxes, sales taxes, or income taxes), which alleviates this concern.

TABLE 1
Variable Descriptions and Census Data Definitions

Variable Name	Variable Description	Census Data Definitions
Administrative	Ratio of administrative operating expenses/total operating expenses	(E23 + E29 + E89)/E
Cash	Ratio of year-end cash to monthly operating and interest expenses	(W31 + W61)/(E + I)/12
Change in property taxes	(Property taxes$_t$ − property taxes$_{t-1}$) /population$_t$	(T01$_t$ − T01$_{t-1}$)/population$_t$
Change in total taxes	(Total taxes$_t$ − total taxes$_{t-1}$)/ population$_t$	(T$_t$ − T$_{t-1}$)/population$_t$
CV revenue	Coefficient of variation in revenue	NA
Debt per capita	Ratio of total debt outstanding to total population	Account type 1/population$_t$
Excess cash	Residuals from OLS model of cash determinants (in Table 3)	NA
Growth	(Population$_t$ − population$_{t-5}$)/ population$_{t-5}$	NA
High cash	1 if cash residuals are in the highest quartile in year $t-1$; else 0	NA
Limited revenue	Revenue diversification index, or (r$_1$/R)(r$_2$/R),...,(r$_N$/R), where r is the amount of revenue received from a specific source, and R is total revenue	r = T01, T09, or T40; R = T01 + T09 + T40
Low cash	1 if cash residuals are in the lowest quartile in year $t-1$; else 0	NA
Size	Log of total population	NA
State revenue	State revenue/Total revenue	C/(A + B + C + D + T + U)
Tax limits	1 if municipality is in a state with property tax limits; else 0	NA

TABLE 2
Sample Selection

Total Observations in Census database	80,125
Less observations with missing data	−4,043
	76,082
Less data errors	−57
	76,025
Less observations for municipalities with less than four years of data	−66,612
Final Census data sample	9,413

Panel B of Table 3 presents descriptive statistics for select variables. The first two columns present data for the full Census database. The next four columns compare characteristics of observations used in my tests ("test sample") with those eliminated due to a lack of voluntary disclosure of interim Census data ("non-reporters"). Focusing on columns 3 and 4, the mean cash level of 10.4 months and median of 8.3 months show that the

TABLE 3
Descriptive Statistics

Panel A: Ratio of Cash/Monthly Operating and Interest Expenditures by Year

Year	Total Sample Mean (Median)
1997 (n = 31,707)	12.10 (8.33)
1998 (n = 4,169)	10.15 (7.66)
1999 (n = 4,208)	10.78 (8.33)
2000 (n = 4,859)	11.36 (8.61)
2001 (n = 1,848)	11.37 (8.88)
2002 (n = 27,592)	14.77 (11.01)
2003 (n = 1,642)	11.98 (9.31)
Total (n = 76,025)	12.82 (9.25)

(*continued on next page*)

TABLE 3 (continued)

Panel B: Comparison of Descriptive Statistics for Select Test Variables

	Full Sample (n = 76,025)		In Census 5 Years (Test Sample) (n = 9,413)		In Census < 5 Years (n = 66,612)		
Variable	**Mean (Median) (1)**	**Standard Deviation (2)**	**Mean (Median) (3)**	**Standard Deviation (4)**	**Mean (Median) (5)**	**Standard Deviation (6)**	**Difference (7)**
Cash	12.82 (9.25)	11.28	10.44 (8.34)	8.38	13.16 (9.42)	11.60	4.07***
Debt per capita	0.54 (0.04)	1.16	1.36 (0.88)	1.71	0.42 0.00	1.00	5.45***
Limited revenue	0.26 (0.27)	0.06	0.27 (0.29)	0.05	0.25 (0.27)	0.06	3.25***
Size	7.54 (7.35)	1.88	9.64 (9.82)	1.78	7.25 (7.12)	1.69	18.78***
Growth	0.03 (0.00)	0.08	0.02 (0.00)	0.05	0.03 (0.00)	0.09	2.87***
State revenue	0.20 (0.14)	0.18	0.15 (0.11)	0.13	0.21 (0.15)	0.19	3.88***
Administrative	0.25 (0.21)	0.17	0.17 (0.14)	0.12	0.26 (0.22)	0.18	8.81***

(continued on next page)

TABLE 3 (continued)

Panel C: Pearson Correlations for Select Test Variables

	Cash	*CV revenue*	*Debt per capita*	*Limited revenue*	*Size*	*Growth*	*State revenue*	*Admin*	*Change in property taxes*	*Change in total taxes*
Cash	1.00									
CV revenue	0.16$^{\#}$	1.00								
Debt per capita	−0.08$^{\#}$	−0.05$^{\#}$	1.00							
Limited revenue	0.14$^{\#}$	−0.08$^{\#}$	−0.03$^{\#}$	1.00						
Size	−0.15$^{\#}$	−0.34$^{\#}$	−0.17$^{\#}$	0.31$^{\#}$	1.00					
Growth	0.10$^{\#}$	0.05$^{\#}$	0.01	0.01	0.08$^{\#}$	1.00				
State revenue	−0.03$^{\#}$	0.11$^{\#}$	−0.13$^{\#}$	0.15$^{\#}$	−0.09$^{\#}$	−0.07$^{\#}$	1.00			
Administrative	0.25$^{\#}$	0.26$^{\#}$	−0.16$^{\#}$	0.04$^{\#}$	−0.27$^{\#}$	0.04$^{\#}$	0.11$^{\#}$	1.00		
Change in property taxes	−0.05$^{\#}$	−0.00	0.09$^{\#}$	−0.08$^{\#}$	0.04$^{\#}$	0.06$^{\#}$	−0.03$^{\#}$	−0.03$^{\#}$	1.00	
Change in total taxes	−0.01	0.03$^{\#}$	0.13$^{\#}$	−0.01	0.05$^{\#}$	0.07$^{\#}$	−0.08$^{\#}$	−0.03$^{\#}$	0.76$^{\#}$	1.00

$^{\#}$ Indicates significance at $p < .05$; based on two-tailed tests.

*** Indicates significance at $p < 01$; based on two-tailed tests.

Variable Definitions:

Cash = ratio of total cash and marketable securities to monthly operating and interest expenditures;
CV revenue = coefficient of variation of total revenue, measured as the ratio of the standard deviation of total revenue/mean total revenue, over the prior four years ending at year *t*;
Debt per capita = total debt outstanding/total population;
Limited revenue = revenue diversification index, or $(r_1/R)(r_2/R),\ldots,(r_N/R)$, where r is the amount of revenue received from a specific source, and R is total revenue;
Size = log of population;
Growth = change in population from $t-5$ to t, deflated by population in year $t-5$;
State revenue = total state revenue received/total revenue;
Administrative = ratio of total administrative expenses/total operating expenditures;
Change in property taxes = ratio of the change in property taxes from $t-1$ to t, deflated by population in year t; and
Change in total taxes = ratio of the change in total taxes from t-1 to t, deflated by population in year t.

sample cash balances are significantly smaller than for the full population of municipalities in columns 1 and 2. The test sample differs along other dimensions as well. Namely, univariate tests of differences in column 7 find that sample municipalities have higher debt, more limited revenue sources, are larger, growing less, receive less state revenue, and spend proportionately less on administrative expenses than do municipalities that do not voluntarily report interim Census data.[9]

Panel C of Table 3 shows correlations for select test variables. Cash holdings are positively associated with the coefficient of variation in revenue, growth, and limited revenue sources. Cash holdings are inversely related to debt per capita, size and the change in property taxes.

Empirical Results

I estimate OLS regressions to determine expected cash holdings and present the results in Table 4. The dependent variable is the ratio of cash/monthly operating and interest expenditures. Fiscal year-end, state, and year indicators are included in the regressions, but are not tabulated. All regression specifications report t-statistics adjusted for robust standard errors clustered on municipality (Rogers 1993). To mitigate the influence of potential outliers, all continuous variables are winsorized at the top and bottom 1 percent of the distribution.[10]

Results indicate that municipalities with more volatile revenues, more limited revenue sources, and with higher growth have greater cash holdings, while larger municipalities, those with greater debt, and more state funding have less cash. All of the model's explanatory variables are significant, and in the predicted direction. The explanatory power of the full model presented in column 1 is 21 percent, which is similar to that reported in prior nonprofit literature. Overall, my results are consistent with the theory that municipal managers hold cash for precautionary and operational reasons.

Descriptive statistics displayed in Table 3 show that many (primarily smaller) municipalities report statistics to the U.S. Census only when required (every five years), while others voluntarily report such data annually. It is also apparent that municipalities reporting annual data differ along other dimensions as well. Prior literature suggests that firms that do not voluntarily disclose information are more likely to be associated with agency problems (Graham et al. 2005). It is unclear whether the deleted non-reporters potentially have greater agency concerns, however. That is, univariate tests show that non-reporters have higher cash holdings and spend more on administrative expenses, consistent with agency concerns. The tests also reveal that non-reporters are smaller and experience higher growth, which implies they are more likely to have greater cash needs. Thus, the impact of deleting these municipalities is not obvious.

To consider the possibility that self-selection is a concern, I estimate a first-stage probit specification of the choice to report interim data to the Census (not tabulated), and include the inverse Mills ratio in the cash determinants specification in model 2 of Table 4. Results are consistent with those for the first specification that does not consider self-selection. In addition, I conduct a robustness check that drops the coefficient of variation in revenue

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[9] Note that differences between the test sample and deleted non-reporting municipalities are considered further in subsequent sections.

[10] I conduct three (unreported) alternate specifications tests in place of winsorizing the data. First, I eliminate very small municipalities with a population of less than 2,000 for consistency and comparability across observations, following Figlio and O'Sullivan (2001). Second, influential observations are identified and eliminated using Cook's D and leverage points. Third, rank regressions are employed. Results for all three procedures are consistent with those presented.

TABLE 4
Determinants of Municipal Cash Holdings

Variable	**Model 1[a] (n = 9,413)**	**Model 2[a] (n = 9,413)**
Intercept	19.95 (10.01)***	11.47 (3.13)***
$CV\ revenue_{t-t-4}$	7.92 (6.00)***	7.76 (5.86)***
$Debt\ per\ capita_t$	−0.24 (−2.72)***	−0.19 (−2.15)**
Limited revenue	21.74 (8.91)***	21.32 (8.74)***
$Size_t$	−0.94 (−10.07)***	−0.37 (−1.54)
Growth	12.46 (7.00)***	12.59 (7.08)***
State revenue	−3.89 (−3.06)***	−4.20 (−3.28)***
Lambda		2.71 (2.79)***
Quarter dummies	Included[b]	Included[b]
Year dummies	Included[b]	Included[b]
State dummies	Included[b]	Included[b]
Adjusted R^2	0.21	0.21

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*, **, *** Indicate significance at $p < .10$, 0.05, and 01, respectively; based on two-tailed tests.

[a] t-statistics are reported in parentheses, using robust standard errors clustered on municipality.

[b] For brevity, the quarter-specific, year-specific, and state-specific intercept terms are not reported.

This table presents estimates for an OLS regression model, where the dependent variable is the ratio of total cash and marketable securities to monthly operating and interest expenditures.

Variable Definitions:

CV revenue = coefficient of variation of total revenue, measured as the ratio of the standard deviation of total revenue/mean total revenue, over the prior four years ending at year *t*;
Debt per capita = total debt outstanding/total population;
Limited revenue = revenue diversification index, or $(r_1/R)(r_2/R),\ldots,(r_N/R)$, where r is the amount of revenue received from a specific source, and R is total revenue;
Size = log of population;
Growth = change in population from $t-5$ to t, deflated by population in year $t-5$;
State revenue = total state revenue received/total revenue; and
Lambda = inverse Mills ratio computed from a first-stage probit specification of the choice to voluntarily disclose interim Census data.

from model 1 because this variable requires four years of data. This specification therefore retains most observations from 1997 and 2002, when Census reporting is required. Results are qualitatively similar to those reported.

It is plausible that some municipalities borrow on a short-term basis, in anticipation of receiving a large lump-sum collection of revenue in the near future, such as from sales or property taxes (deemed "tax anticipation notes"). In this case, cash balances at a point in time can appear large, when in fact typical balances are quite different. In additional unreported tests, I include the log of new debt issued in the current year as a control, both with and without the inclusion of total debt outstanding. I find that the amount of new debt issued is not significantly associated with cash holdings.

Finally, as two alternate debt market measures, I control for the frequency of public debt issuance and bond ratings (not reported). Note that doing so requires a large sample size reduction due to data constraints, and because many municipalities do not access public debt markets. I find that neither bond ratings nor the frequency of public debt issuance is significantly associated with cash holdings, while the remaining results are consistent with those reported in Table 4.

III. AGENCY IMPLICATIONS OF EXCESS CASH HOLDINGS

While Section II explores the determinants of expected cash holdings, I now examine municipal managers' use of excess cash, which is defined as holdings above the benchmark levels measured in Table 4. I consider two reasons why municipal managers accumulate excess cash. First, managers can save excess cash to reduce the volatility of future services, consistent with prudent financial management and the notion of rainy day funds. Second, managers can accumulate excess cash holdings because they are acting in a self-interested manner. Jensen (1986) predicts that holding excess cash leads to agency problems, in that managers spend cash on perquisite consumption and do not return it to shareholders.

I next explore whether holding excess cash is consistent with prudent financial management or leads to agency problems by examining associations with municipal efficiency (administrative overhead), manager compensation, and tax reductions.

Excess Cash and Administrative Overhead Expenses

Nonprofit sector research measures efficiency through the program expense ratio, defined as the ratio of program expenses/total operating expenses. The program expense ratio measures the efficiency with which funds are spent toward production of the nonprofit's main purpose, or programs, rather than toward overhead expenses such as fundraising or administration. Prior research suggests that lower program expense ratios are evidence of agency problems between managers and donors (Core et al. 2006). Similarly, if holding excess cash leads to inefficient spending in the municipal sector, then there should be a positive relation between administrative expenses and excess cash. If holding excess cash indicates prudent financial management and increased efficiency, then there should be a negative relation between excess cash and administrative expenses.

I empirically examine the relation between excess cash and administrative expenses using the following OLS model:

$$\begin{aligned} Administrative_{it} = {} & \alpha_0 + \alpha_1 Excess\ cash_{it-1} + \alpha_2 Debt\ per\ capita_{it} + \alpha_3 Size_{it} \\ & + \Sigma\alpha_k State_k + \Sigma\alpha_t Year_t \end{aligned} \tag{2}$$

where *Administrative* is defined as the ratio of total administrative expenses deflated by total operating expenses; and the remaining variables are described previously.

I use the administrative expense ratio rather than the program expense ratio typically used in nonprofit sector research because measuring total services in the municipal sector is somewhat problematic. In contrast to nonprofit organizations, municipalities do not typically disclose program service expenses separately. For example, while a municipality may disclose the total expenditures toward roads, the accounting numbers are likely to include both direct road expenses and an administrative overhead component. Nonetheless, Census data contain sufficient detail to distinguish certain administrative expenses from program services. I measure the amount of administrative expenses following Figlio and O'Sullivan (2001), and include central staff services, financial administration, and unallocable expenses.

I use two measures of excess cash. The first includes the residuals from the expected cash model presented in Table 4, following Core et al. (2006). The second measure incorporates two indicator variables to distinguish municipalities in the highest and lowest quartile of residuals.

I include several control variables. Core et al. (2006) find a positive relation between debt outstanding and efficiency, so I include total debt per capita as a control. In addition, subjecting municipalities to outside monitoring by voters, such as by requiring a vote on new bond issues, likely increases efficiency.[11] Larger municipalities are more likely to spend funds efficiently on administrative overhead because they have economies of scale in operations, so I include the log of population to control for size. Finally, I include year and state indicator variables.

Table 5 presents the results. Note that the sample size in Table 5 is smaller than in Table 4 because the excess cash variable is lagged. Column 1 shows a positive and significant relation between excess cash and administrative expenses when excess cash is measured using a continuous variable. Column 2 shows the significant positive relation between excess cash and administrative expenses is robust to using an indicator variable for the highest quartile of excess cash. In terms of economic significance, the results show that municipalities in the highest excess cash quartile spend approximately 2 percent more than those in the bottom three quartiles. Further, using the coefficient for the continuous residuals multiplied by 12, because the cash determinants model dependent variable is deflated by monthly expenses, reveals that municipalities with excess cash spend 12 percent more on administrative expenses annually.

With respect to the control variables, size is negatively associated with administrative overhead expenses. Further, municipalities that are subjected to more frequent outside monitoring by voters in the form of higher debt are associated with less overhead spending. Overall, the administrative expense model regression adjusted R^2s of 25 percent are fairly comparable to those in the nonprofit literature.

Excess Cash and Municipal Managers' Compensation

While the preceding results provide evidence that municipal managers spend excess cash disproportionately on administrative expenses, such tests do not directly measure whether managers spend excess cash on perquisites. A more direct test of whether municipal managers with excess cash consume perquisites or act consistent with prudent financial management is to examine salaries. Core et al. (2006) find that nonprofits with excess cash pay their CEOs and officers significantly higher compensation, consistent with agency problems. Similarly, if municipal managers with excess cash behave opportunistically, then I anticipate a positive relation between excess cash and managers' salaries.

I use the following OLS model to examine the relation between excess cash and municipal managers' salaries:

$$Comp_{it} = \alpha_0 + \alpha_1 Excess\ cash_{it-1} + \alpha_2 Size_{it} + \Sigma\alpha_k State_k + \Sigma\alpha_t Year_t \qquad (3)$$

where *Comp* is defined as the log of the manager's total base salary compensation and the remaining variables are described previously.

I focus on the chief administrative officer, or CAO, because this position is present across a broad cross-section of municipalities. Note that in the case of cities, the CAO is

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[11] An alternate proxy for outside monitoring uses an indicator variable equal to 1 if a new bond is issued in the current year, with results consistent with those reported.

TABLE 5
The Relation between Excess Cash and Administrative Overhead Expenses

Variable	**Model 1[a]** **(n = 7,379)**	**Model 2[a]** **(n = 7,379)**
Intercept	0.44 (19.97)***	0.43 (19.26)***
Excess cash$_{t-1}$	0.01 (7.87)***	
High cash$_{t-1}$		0.02 (7.08)***
Low cash$_{t-1}$		−0.00 (−0.03)
Debt per capita	−0.01 (−5.36)***	−0.01 (−5.28)***
Size	−0.02 (−14.24)***	−0.02 (−14.06)***
Year dummies	Included[b]	Included[b]
State dummies	Included[b]	Included[b]
Adjusted R^2	0.25	0.25

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*, **, *** Indicate significance at $p < .10$, 0.05, and 01, respectively; based on two-tailed tests.

[a] t-statistics are reported in parentheses, using robust standard errors clustered on municipality.

[b] For brevity, the year-specific and state-specific intercept terms are not reported.

This table presents estimates for an OLS regression model, where the dependent variable is the ratio of total administrative expenses/total operating expenditures.

Variable Definitions:

Excess cash = residuals from an OLS regression of Model 2 in Table 4, and is calculated separately for each year;
High cash = dummy variable equal to 1 if the *Excess cash* residuals are in the upper quartile for each year;
Low cash = dummy variable equal to 1 if the *Excess cash* residuals are in the lower quartile for each year;
Debt per capita = total debt outstanding/total population; and
Size = log of population.

typically the city manager, while in the case of towns, the CAO is the top administrator. In contrast, the majority of elected officials hold part-time positions with relatively low salaries. Detailed CAO compensation data are available through surveys provided by the International City/County Manager Association (ICMA). ICMA survey data are commonly used in the economics literature, and the survey response rates are typically high (i.e., 52 percent for 2003 compensation data). I use two such surveys in the tests that follow—the salary surveys, which provide CAO salaries, and the fringe benefit surveys, which provide data for CAO bonuses, age, tenure, and level of education.

Descriptive statistics for the 2000–2003 salary data are in Panel A of Table 6. The mean manager salary is $98,450, while the mean tenure is 7.5 years. On average, 94 percent of managers have college degrees. Note that the ICMA survey distinguishes managers by age category, where 1 represents ages less than or equal to 30 years old, 2 represents ages 31–35, etc. Managers are between the ages of 46 and 50 on average, which is represented by the age category of 5.

Multivariate results are presented in Panel B of Table 6. Model 1 shows a positive and significant relation between excess cash and managers' salaries ($t = 5.82$), and model 2

TABLE 6
The Relation between Excess Cash and Manager Compensation

Panel A: Descriptive Statistics for Manager Compensation Data

Variable	n	Mean	Median	Standard Deviation	25th Percentile	75th Percentile
Salary (in $$$)	2,713	98.45	93.30	34.25	74.09	117.53
Bonus	1,635	0.24	0.00	0.42	0.00	0.00
Tenure	1,635	7.45	6.00	6.15	3.00	11.00
Degree	1,635	0.94	1.00	0.24	1.00	1.00
Age	1,635	5.42	6.00	1.47	5.00	6.00

Panel B: Multivariate Regressions of Manager Annual Base Salary

Variable	Model 1[a] (n = 2,713)	Model 2[a] (n = 2,713)	Model 3[a] (n = 1,082)	Model 4[a] (n = 1,082)
Intercept	9.82	9.81	9.39	9.38
	(155.71)***	(154.55)***	(127.15)***	(129.11)***
Excess cash$_{t-1}$	0.01		0.002	
	(5.82)***		(2.31)**	
High cash$_{t-1}$		0.04		0.04
		(4.04)***		(3.15)***
Low cash$_{t-1}$		−0.02		0.01
		(−1.47)		(0.48)
Size	0.16	0.16	0.17	0.17
	(29.02)***	(28.70)***	(23.55)***	(23.94)***
Tenure			0.04	0.04
			(5.45)***	(5.58)***
Age			0.07	0.07
			(3.45)***	(3.46)***
Degree			0.11	0.11
			(4.17)***	(4.13)***
Year dummies	Included[b]	Included[b]	Included[b]	Included[b]
State dummies	Included[b]	Included[b]	Included[b]	Included[b]
Adjusted R^2	0.70	0.70	0.73	0.73

Panel C: Multivariate Regressions of Manager Bonus

Variable	Model 1[c] (n = 1,635)	Model 2[c] (n = 1,635)	Model 3[c] (n = 1,616)	Model 4[c] (n = 1,616)
Intercept	−1.62	−1.80	−2.26	−2.42
	(−4.00)**	(−4.82)**	(−6.25)**	(−7.06)***
Excess cash$_{t-1}$	0.02		0.02	
	(5.54)**		(3.42)*	
High cash$_{t-1}$		0.41		0.36
		(7.83)***		(5.69)**
Low cash$_{t-1}$		0.10		0.11
		(0.33)		(0.42)
Size	0.11	0.11	0.13	0.14
	(3.02)*	(3.26)*	(3.72)**	(3.92)**
Tenure			0.65	0.65
			(65.32)***	(65.20)***

(*continued on next page*)

TABLE 6 (continued)

Variable	Model 1[c] (n = 1,635)	Model 2[c] (n = 1,635)	Model 3[c] (n = 1,616)	Model 4[c] (n = 1,616)
Age			−0.57 (−6.33)***	−0.57 (−6.22)***
Degree			0.24 (0.68)	0.23 (0.63)
Year dummies	Included[b]	Included[b]	Included[b]	Included[b]
State dummies	Included[b]	Included[b]	Included[b]	Included[b]
Likelihood ratio	101.32	103.79	176.79	179.08

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*, **, *** Indicate significance at $p < .10$, 0.05, and 01, respectively; based on two-tailed tests.

[a] t-statistics are reported in parentheses, using robust standard errors clustered on municipality.

[b] For brevity, the year-specific and state-specific intercept terms are not reported.

[c] Chi-square statistics are reported in parentheses, using robust standard errors.

This table presents estimates for an OLS regression model in Panel B, where the dependent variable is the log of total annual base salary compensation, and a logit model in Panel C, where the dependent variable is a dummy variable equal to 1 if a bonus is received.

Variable Definitions:

Excess cash = residuals from an OLS regression of Model 2 in Table 4, and is calculated separately for each year;
High cash = dummy variable equal to 1 if the *Excess cash* residuals are in the upper quartile for each year;
Low cash = dummy variable equal to 1 if the *Excess cash* residuals are in the lower quartile for each year;
Size = log of population;
Tenure = log of the years the manager has been in his current position;
Age = log of the manager's age category, where 1 = ages <30, 2 = ages 31–35,...,10 = ages >70; and
Degree = dummy variable equal to 1 if the manager has an undergraduate or graduate degree, and 0 otherwise.

shows that governments with cash in the top quartile pay managers significantly more (t = 4.04), while governments in the bottom quartile pay less (t = −1.47). However, the preceding results do not consider manager-specific variables that potentially explain manager salaries, such as the manager's age, tenure, and level of education. I next control for these characteristics by merging the salary survey data with the fringe benefit survey data for the subset of municipalities with ICMA data available. The salary and fringe benefit surveys are prepared within two months of each other (for the same fiscal year), and therefore are likely to contain data for the same given CAO. However, it is possible that the CAO left in the two months between surveys. Excluding CAOs with tenure of less than one year yields results consistent with those reported.

Results are presented as models 3 and 4 of Table 6. Although somewhat weaker (t = 2.31 and 3.15 in columns 3 and 4, respectively), the results still show a significantly positive relation between excess cash holdings and annual salary. With respect to the control variables, I find that the managers' tenure, age, and degree all vary directly with salaries. The overall explanatory power of the models is high, with adjusted R^2s in the 70–73 percent range.

Municipal managers are sometimes paid bonuses, which presents another means of testing whether municipalities spend excess cash consistent with agency problems, or consistent with prudent financial management. I next examine the relation between excess cash holdings and whether municipal managers receive bonuses. Note that while ICMA data identify whether managers receive a bonus, it does not disclose the dollar amounts. Note further that the bonus is not included in the regressions of annual base salary presented in

Panel A of Table 6, so this specification does not replicate the salary specifications. Descriptive statistics in Panel A reveal that 24 percent of CAOs receive such bonuses.

The results in Table 6, Panel C, model 1 show that the excess cash residuals are positively associated with the probability of receiving a bonus, and model 2 finds that those with high excess cash holdings are driving the results ($t = 7.83$). Municipalities with low excess cash holdings are not significantly associated with the provision of bonuses. Models 3 and 4 control for manager characteristics, and reveal that managers with longer tenures and those who are relatively younger are more likely to receive bonuses. Results for model 3 show that bonuses are marginally significantly associated with excess cash residuals ($p < 0.10$) while significantly associated with high excess cash holdings in model 4. The overall evidence is consistent with the premise that managers of municipalities with high cash holdings receive higher salaries and bonuses, which supports the agency hypothesis, and is inconsistent with prudent financial management.

Growth as an Alternate Explanation

An alternative explanation for the preceding results is that growing municipalities save cash to finance future capital or infrastructure expenditures, and that such municipalities are also likely to attract more talented (and hence higher-paid) managers. Evidence from two approaches contradicts this characterization.

First, I control for growth in the primary cash determinants model in Table 4 using the change in population over five years, which is a common measure of growth in the municipal sector (e.g., Baber and Gore 2008). Second, in unreported tests, I add the growth measure to specifications in Tables 5 and 6, and find results consistent with those reported. The coefficient for the growth variable is not significant in the latter two specifications, however. Thus, the evidence is not consistent with excess cash held to address future infrastructure needs attributable to growth.

Distributing Excess Cash to Citizens

For corporations, one means of resolving agency concerns is to return excess cash to shareholders in the form of a dividend. Payouts to shareholders reduce the resources under managers' control, thus reducing the potential agency problems associated with excess cash. The municipal equivalent to a cash distribution is a reduction in taxes or the payment of a rebate to citizens. Municipalities can reduce property taxes in three ways: by reducing tax rates directly, by reducing assessed values, or by providing rebates to citizens. The use of the change in taxes captures all three of these components.

I test the relation between excess cash and the reduction in taxes using the following OLS regression model:

$$\begin{aligned} \Delta Taxes_{it} = {} & \alpha_0 + \alpha_1 \Delta Excess\ cash_{it-1} + \alpha_2 Tax\ limits + \alpha_3 Size_{it} + \alpha_4 Growth_{it} \\ & + \alpha_5 \Delta State\ revenue_{it} + \alpha_6 \Delta Debt_{it} + \alpha_7 Lagged\ \Delta taxes_{it} \\ & + \alpha_8 \Delta Lagged\ tax\ levels_{it} + \Sigma \alpha_t Year_t \end{aligned} \tag{4}$$

where:

$\Delta Taxes$ = alternately using the change in property taxes from year $t-1$ to t, and the change in total taxes from year $t-1$ to t, with each deflated by population;

ΔExcess cash = change in excess cash residuals from year $t-2$ to year $t-1$, deflated by excess cash residuals in year $t-2$;
Tax limits = an indicator variable equal to 1 for municipalities in states that impose effective property tax limits (following Poterba and Reuben (1995), and 0 otherwise;
ΔState revenue = change in total state revenue received/total revenue from year $t-1$ to t;
ΔDebt = change in debt per capita from year $t-1$ to t;
Lagged Δtaxes = lagged change in taxes; and
Lagged tax levels = lagged taxes per capita.

The remaining variables are defined previously. Negative α_1 indicates that municipalities return excess cash to citizens.

Univariate correlations, presented in Panel C of Table 3, indicate a statistically significant negative correlation between the change in property taxes and cash holdings, while the relation between the change in total taxes and cash holdings is not significant. Table 7 presents multivariate results for Equation 4. After controlling for other variables, I find no association between excess cash and either the change in property taxes (models 1 and 2), or the change in total taxes (models 3 and 4).[12] Such results contradict a characterization that cash holdings are returned to citizens through tax reductions.

IV. EXCESS CASH AND MANAGER ENTRENCHMENT

The results in Section III are consistent with managers engaging in self-interested behavior in the presence of high cash holdings. This section considers directly whether governance characteristics such as manager entrenchment and board (council) independence are associated with cash holdings. Evidence in Harford et al. (2008) indicates that the relation between manager entrenchment and cash holdings is not straightforward. On one hand, entrenched managers value the flexibility of holding high cash levels. Under this scenario, when entities generate excess cash, entrenched managers prefer to accumulate it rather than spend it, leading to a positive relation between cash holdings and entrenchment. On the other hand, entrenched managers may instead prefer to spend excess cash immediately, which leads to a negative relation between manager entrenchment and cash. Therefore, existing theory provides no basis for whether entrenchment increases or decreases cash holdings.

Examining all measures of manager entrenchment and governance characteristics are beyond the scope of this study. Instead, I focus on two well-documented measures used in prior research, namely, staggered boards and board independence. Prior studies find that measures of manager entrenchment are generally the most important indicators of poor performance (Bebchuk and Cohen 2005) and internal control issues, such as accounting restatements (Baber et al. 2007). Further, among the entrenchment governance mechanisms examined by Bebchuk and Cohen (2005), one of the most important indicators of management entrenchment is whether a firm has a staggered (or classified) board. Prior research finds that staggered boards are highly resistant to takeover (Bebchuk et al. 2002), and significantly insulate management from market discipline in the form of turnover (Faleye 2007). I therefore include an indicator variable equal to 1 if city council elections are staggered, and 0 otherwise.

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[12] In further tests (not tabulated), I estimate a logit model where the dependent variable is defined as 1 if taxes are reduced, and 0 otherwise. Results are consistent with those presented.

TABLE 7
The Relation between Excess Cash and the Reduction of Taxes

	Dependent Variable			
	Change in property taxes		***Change in total taxes***	
Variable	**Model 1[a] (n = 4,774)**	**Model 2[a] (n = 4,774)**	**Model 3[a] (n = 4,774)**	**Model 4[a] (n = 4,774)**
Intercept	−0.01 (−2.27)**	−0.01 (−2.29)***	0.01 (1.03)	0.01 (1.00)
ΔExcess cash	0.00 (1.37)		0.00 (0.28)	
ΔHigh cash		−0.00 (−0.12)		0.00 (0.23)
ΔLow cash		0.00 (0.22)		−0.00 (−0.07)
Tax limits	0.01 (3.67)***	0.01 (3.65)***	0.02 (4.92)***	0.02 (4.88)***
Size	−0.00 (−0.69)	−0.00 (−0.65)	−0.00 (−4.82)***	−0.00 (−4.73)***
Growth	0.13 (4.20)***	0.13 (4.25)***	0.30 (5.15)***	0.30 (5.19)***
ΔState revenue	−0.15 (−5.53)***	−0.15 (−5.53)***	−0.23 (−5.81)***	−0.23 (−5.85)***
ΔDebt	0.01 (3.53)***	0.01 (3.54)***	0.01 (1.33)	0.01 (1.31)
Lagged Δtaxes	−0.21 (−5.36)***	−0.21 (−5.37)***	−0.24 (−7.15)***	−0.24 (−7.13)***
Lagged tax levels	0.09 (22.19)***	0.09 (22.29)***	0.09 (21.06)***	0.09 (21.04)***
Year dummies	Included[b]	Included[b]	Included[b]	Included[b]
Adjusted R^2	0.37	0.37	0.26	0.26

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*, **, *** Indicate significance at $p < .10$, 0.05, and 01, respectively; based on two-tailed tests.

[a] t-statistics are reported in parentheses, using robust standard errors clustered on municipality.

[b] For brevity, the year-specific intercept terms are not reported.

This table presents estimates for an OLS regression model, where the dependent variable is the ratio of the change in property taxes from $t-1$ to t, deflated by population in year t (models 1 and 2), or the ratio of the change in total taxes from $t-1$ to t, deflated by population in year t (models 3 and 4).

Variable Definitions:

ΔExcess cash = change in residuals from year $t-2$ to $t-1$, deflated by residuals in year $t-2$, for an OLS regression of Model 2 in Table 4, and is calculated separately for each year;
ΔHigh cash = dummy variable equal to 1 if the *ΔExcess cash* residuals are in the upper quartile each year;
ΔLow cash = dummy variable equal to 1 if the *ΔExcess cash* residuals are in the lower quartile for each year;
Tax limits = dummy variable equal to 1 if the local government resides in a state with effective property tax limitation measures, and 0 otherwise;
Size = log of population;
Growth = change in population from $t-5$ to t, deflated by population in year $t-5$;
ΔState revenue = change in total state revenue received/total revenue;
ΔDebt = change in debt per capita;
Lagged Δtaxes = lagged change in taxes; and
Lagged tax levels = lagged taxes per capita.

Second, I consider council independence. Measuring council independence is not straightforward, however, because little empirical evidence exists about noncorporate board governance. In an examination of nonprofit boards, O'Regan and Oster (2005) indicate that nonprofit boards are typically comprised solely of members that are outside of the organization—that is, employees are seldom on the board. As a substitute measure of independence, O'Regan and Oster (2005) use an indicator variable equal to 1 if the CEO votes on the council. However, it is not known empirically how often elected officials either vote or sit on the council. I therefore include two measures of council independence: an indicator variable equal to 1 if the top elected official votes on the council, and an indicator variable equal to 1 if the top elected official sits on the council.

Finally, following Harford et al. (2008), I also include a measure of council size. I collect data for staggered councils, council independence, and council size using the ICMA governance survey data for the subset of municipalities for which data are available. Note that data are for 2002, since ICMA governance data are only collected every five years.

Descriptive statistics for the governance measures are shown in Panel A of Table 8. Overall, the chief elected official is allowed to vote on the council for 58 percent of sample municipalities, the chief elected official sits on 66 percent of councils, and 78 percent of all councils have staggered elections. In addition, the average council contains seven members. Univariate correlations in Panel B of Table 8 show that cash holdings are positively correlated with staggered councils, and whether the chief elected official votes on the council or sits on the council. Cash holdings are negatively correlated with council size.

Table 8, Panel C presents multivariate results between cash holdings and governance measures, using the cash regression specification presented in Table 4, model 2, with the addition of governance characteristics, following a design similar to Harford et al. (2008). Results show that staggered councils and councils where the top elected official either votes or sits on the council are positively associated with cash holdings, while council size is negatively associated with cash holdings. The results, while preliminary in nature, are consistent with entrenched managers holding more cash, while cities with large councils holding less cash.

V. CONCLUSION

Local governments are a significant and growing sector of the economy, comprising 20 percent of gross domestic product and holding approximately $1.2 trillion in cash in 2002. In comparison, consider that Opler et al. (1999) report corporate cash holdings of $716 billion in 1994 for the S&P 500. As such, the lack of research investigating the implications of municipal cash holdings is surprising. This study examines the determinants of municipal cash holdings from 1997–2003, as well as some of the agency implications of holding high cash levels. Such research provides evidence about municipal managers' stewardship over citizens' resources, which is one of the primary purposes of governmental financial reporting (GASB 2006). In addition, understanding the determinants and consequences of municipal cash holdings informs the recent policy debate about governmental rainy day funds.

Overall, the evidence is consistent with managers holding cash for operational and precautionary reasons. Namely, I find that municipalities with a higher variation in revenues, more limited revenue sources, and higher growth hold higher levels of cash. Larger municipalities and those with more state funding tend to hold less cash. In contrast with prior literature, I find no consistent relation between access to credit markets and cash holdings.

The analysis also provides evidence that municipalities with high cash levels, or excess cash, spend significantly more on administrative expenses, manager salaries, and bonuses.

TABLE 8
The Relation between Cash Holdings and Manager Entrenchment

Panel A: Descriptive Statistics for Management Entrenchment Variables (n = 4,047)

Variable	**Mean**	**Median**	**Standard Deviation**
Cash	10.04	9.29	7.13
CEO votes on council	0.58	1.00	0.49
CEO on council	0.66	1.00	0.47
Staggered council	0.78	1.00	0.42
Board size (unlogged)	6.93	7.00	2.77

Panel B: Pearson Correlations for Measures of Manager Entrenchment (n = 4,047)

	Cash	*CEO votes on council*	*CEO on council*	*Staggered council*	*Board size*
Cash	1.00				
CEO votes on council	0.10#	1.00			
CEO on council	0.11#	0.77#	1.00		
Staggered council	0.20#	0.19#	0.21#	1.00	
Board size	−0.09#	−0.27#	−0.23#	−0.19#	1.00

Panel C: Multivariate Regressions of Manager Entrenchment

Variable	**(1)[a] (n = 4,047)**	**(2)[a] (n = 4,047)**	**(3)[a] (n = 4,047)**	**(4)[a] (n = 4,047)**
Intercept	2.45	4.18	3.29	6.17
	(0.61)	(1.00)	(0.79)	(1.51)
CEO votes on council	0.81			
	(2.27)**			
CEO on council		0.96		
		(2.58)***		
Staggered council			1.05	
			(2.30)**	
Board size				−1.74
				(−2.92)***
CV revenue$_{t-t-4}$	10.45	10.69	9.74	9.92
	(5.07)***	(5.30)***	(4.80)***	(5.07)***
Debt per capita$_t$	−0.05	−0.01	−0.07	−0.08
	(−0.40)	(−0.11)	(−0.59)	(−0.64)
Limited revenue	29.61	25.57	30.49	30.03
	(8.56)***	(8.57)***	(8.77)***	(8.69)***
Size$_t$	−0.24	−0.23	−0.21	−0.05
	(−0.96)	(−0.89)	(−0.84)	(−0.19)
Growth	15.24	15.22	15.32	15.00
	(6.47)***	(6.49)***	(6.57)***	(6.50)***
State revenue	−8.69	−8.57	−9.06	−8.75
	(−4.02)***	(−4.04)***	(−4.30)***	(−4.25)***
Lambda	1.50	1.37	1.50	1.45
	(1.66)*	(1.45)	(1.69)*	(1.61)
Quarter dummies	Included[b]	Included[b]	Included[b]	Included[b]

(*continued on next page*)

TABLE 8 (continued)

Variable	(1)[a] (n = 4,047)	(2)[a] (n = 4,047)	(3)[a] (n = 4,047)	(4)[a] (n = 4,047)
Year dummies	Included[b]	Included[b]	Included[b]	Included[b]
State dummies	Included[b]	Included[b]	Included[b]	Included[b]
Adjusted R^2	0.24	0.24	0.25	0.25

# Indicates significance at $p < .05$; based on two-tailed tests.

*, **, *** Indicate significance at $p < .10$, 0.05, and 01, respectively; based on two-tailed tests.

[a] t-statistics are reported in parentheses, using robust standard errors clustered on municipality.

[b] For brevity, the quarter-specific, year-specific, and state-specific intercept terms are not reported.

This table presents estimates for an OLS regression model, where the dependent variable is the ratio of total cash and marketable securities to monthly operating and interest expenditures.

Variable Definitions:

CEO votes on council = dummy variable equal to 1 if the chief elected official votes on the council, and 0 otherwise;
CEO on council = dummy variable equal to 1 if the chief elected official is a member of the council, and 0 otherwise;
Staggered council = dummy variable equal to 1 if council elections are staggered, and 0 otherwise;
Board size = log of council size;
CV revenue = coefficient of variation of total revenue, measured as the ratio of the standard deviation of total revenue/mean total revenue, over the prior four years ending at year *t*;
Debt per capita = total debt outstanding/total population;
Limited revenue = revenue diversification index, or $(r_1/R)(r_2/R),\ldots,(r_N/R)$, where r is the amount of revenue received from a specific source, and R is total revenue;
Size = log of population;
Growth = change in population from $t-5$ to t, deflated by population in year $t-5$;
State revenue = total state revenue received/total revenue; and
Lambda = inverse Mills ratio computed from a first-stage probit specification of the choice to voluntarily disclose interim Census data.

I find no evidence that municipalities with excess cash respond by returning it to citizens in the form of reduced taxes. Additional analysis examining governance characteristics associated with cash holdings finds that cities with staggered councils and councils that are not independent are associated with higher cash levels, consistent with entrenchment. Overall, the evidence is consistent with the view that holding high cash levels is associated with agency problems between municipal managers and citizens. Thus, while rainy day funds can provide precautionary buffers against revenue fluctuations, in the extreme they are associated with agency problems.

The study is subject to various limitations, however. The data are limited to municipalities that report Census data for at least five years, as well as to those that respond to ICMA salary, fringe benefit, and governance surveys. However, the use of Census data also allows a much larger sample than is typically examined in municipal sector research. In addition, ICMA data afford richer tests, because compensation and governance data are not disclosed in municipal financial reports, unlike their corporate and nonprofit counterparts.

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Objective versus Subjective Indicators of Managerial Performance

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ABSTRACT: Managerial bonus payments are frequently determined by both objective and subjective indicators of managerial performance. By its very nature, subjective information is not verifiable for contracting purposes. The inclusion of such information in managerial bonus schemes therefore requires a principal to retain discretion in authorizing actual bonus payments. At the same time, the principal must be able to commit to an overall bonus pool that will be paid out either inside or outside the agency. Our analysis examines the structure of optimal bonus pool arrangements. The nonverifiability of the subjective indicators changes many of the predictions obtained in traditional agency settings with verifiable performance indicators. In particular, our results address the contractual value of additional information variables, the desirability of compressed incentive schemes, and the nature of relative performance evaluation in settings with multiple agents.

Keywords: *discretion; bonus pools; subjective performance measurement.*

I. INTRODUCTION

Theoretical and empirical studies on managerial incentives have increasingly pointed to the role of discretion in determining bonus payments. At the CEO level, several studies have documented that boards have considerable discretion in setting executive pay even after key financial variables for a given time period have been realized; see, for example, Bushman et al. (1996) and Ittner et al. (1997). Other recent evidence on the existence and consequences of discretion in performance evaluation has come from survey data on managers of auto dealerships (Gibbs et al. 2004) and financial services firms (Ittner et al. 2003). In the most comprehensive study to date, Murphy and Oyer (2003) note that

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for nearly two-thirds of the companies in their sample, bonuses are partly based on discretionary assessments of managerial performance.

From a contracting perspective, the main advantage of discretion is that a principal (board of directors or higher-level manager) can rely on performance indicators that may be difficult or even impossible to incorporate into a formal compensation agreement. Consistent with earlier literature, we refer to such performance indicators as subjective rather than objective. Standard examples of objective indicators are audited financial data, such as sales, profit, or asset values. In contrast, direct observations by the principal or informal reports from other agents in the organization to the principal constitute subjective information. By its very nature such information is generally not verifiable for contracting purposes.[1]

Earlier studies on the use of subjective performance indicators have shown that in repeated (infinite horizon) settings, a principal can rely on such information to create implicit incentives. In particular, these games have equilibria such that the agent will exert effort in each period and the principal rewards favorable subjective information.[2] This paper, in contrast, considers the role of subjective information and discretion in a short-term relationship, i.e., in a one-period setting. Subjective performance indicators can be used credibly in short-term incentive contracts if the principal commits to a discretionary bonus pool, the key property of which is that the entire pool is paid out regardless of the subjective information observed by the principal. One can think of the share of the bonus pool given to a particular agent as determined by an implicit contract that "promises" an agent payoffs contingent on the realization of the non-verifiable subjective signals. The principal threatens to withhold parts of an agent's bonus pool in case of unfavorable subjective information and such an arrangement becomes credible if the amount withheld can be paid to other agents either inside or outside the agency. Such bonus pools are widely used in practice, especially in connection with annual bonus plans.[3]

The focus of our analysis is on the joint use of objective and subjective performance indicators in incentive contracts. Due to their non-verifiability, subjective signals entail an additional agency cost because the principal must commit to pay out the entire bonus pool. This naturally raises the following questions. First, under what circumstances should the principal divert part of the bonus pool to third parties? Second, given a set of objective performance measures, will subjective performance indicators that are incrementally informative about an agent's actions always be of additional contracting value? Third, and related to the previous point, do optimal incentive schemes entail compression in the sense that an agent's pay is the same for an entire range of different subjective outcomes? Finally, when the principal contracts with a group of agents, the balancing constraint inherent in discretionary bonus pools naturally raises the question of how one agent's performance is assessed relative to that of others.

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[1] Our use of the terms "objective" and "subjective" information is consistent with that in earlier accounting literature. For instance, Ijiri (1967, Chap. 7) suggests that a central feature of objective information (such as historical cost) is that it is reliable and that it would evoke a consensus when presented to different parties.

[2] Representative papers in this literature include Bull (1987), Baker et al. (1994) and Levin (2003).

[3] Murphy and Oyer (2003) provide a wealth of descriptive information on such plans, using a relatively large proprietary data set. More illustratively, consider the following excerpt from the Walt Disney Co.'s description of its compensation plans for fiscal 2005: "The size of the pool of funds from which bonuses may be awarded to corporate executives ... will depend upon performance against financial goals and other measures established at the outset of the fiscal year. ... For the Company's business segments, 50% of the bonus pool determination will be based upon performance against segment-level financial goals, 30% will be based on other, segment-level performance factors and 20% will be based on the Company's overall performance against the Company performance goals described above under 'Setting Company performance goals.' As in the past, actual bonus awards to individual eligible employees will remain subject to the overall discretion of the Committee."

A fundamental result in agency theory, due to Holmstrom (1979), is that an additional signal is valuable for contracting purposes if and only if it is incrementally informative in a statistical sense, relative to some initial signal. We find that this result does not carry over to subjective signals. Provided the objective signal is sufficiently "strong" relative to its subjective counterpart, the principal will be better off ignoring the subjective signal altogether. In other words, the budget-balancing costs associated with subjective information may result in a "corner solution" rather than merely a reduced weight on the subjective metric.[4]

Incentive arrangements observed in practice frequently appear to be less differentiated than the optimal contracts suggested by agency theory. In particular, contracts used in practice often seem to entail compression in the sense that a range of different signal realizations is effectively pooled into the same outcome. In a one-agent setting with subjective information only, MacLeod (2003) has established that an optimal bonus pool arrangement will pay the entire amount to the agent unless the worst possible subjective outcome materializes. Thus, subjective information and its associated contracting costs lead to a dichotomous incentive contract that treats most outcomes as "acceptable" but punishes extremely unfavorable outcomes.

When the principal can rely on both subjective and objective signals to gauge an agent's unobservable effort, we obtain a "super-compression" result: for all but the lowest possible objective outcome, the subjective metric is ignored and therefore the entire bonus pool corresponding to the particular objective outcome is paid out to the agent. Furthermore, the bonus pool corresponding to the lowest possible objective outcome is also paid out in full to the agent unless the subjective metric also assumes the worst possible outcome. As a consequence, the principal will be forced to divert money to a third party only in the "extreme" event that both the objective and the subjective metric reveal the most unfavorable outcome.

Our finding that subjective information is used in a lexicographic fashion has several implications. First, in the event that the subjective metric is relevant at all, there is no need to determine its exact realization other than to check that the outcome is not the most unfavorable. Second, the result accords with the traditional notion of *conditional variance investigations*.[5] Earlier agency studies on conditional variance investigations have examined the circumstances under which a principal is willing to incur an additional cost so as to observe a secondary signal that provides further information about the agent's action. In the context of our model, there is no cost in acquiring the subjective signal; however, it is costly to use due to the constraints imposed by discretionary bonus pools. Nonetheless, we obtain results that parallel those obtained in the conditional variance investigation literature, notably the use of lower tail investigation policies.

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[4] In deriving this result, we confine attention to incentive contracts based on the realized signals. MacLeod (2003) has shown that if the agent observes another signal that is correlated with the subjective signal received by the principal, then it may be advantageous to employ "message sending" games in which the agent's payoff is determined according to messages sent by both parties. We discuss the class of admissible mechanisms in more detail in Section II below.

[5] In management accounting textbooks (Horngren et al. 2008, Chap. 7) variance investigations are often related to the concept of *management by exception*, that is, an investigation is triggered whenever observed results differ substantially from plan.

When the principal contracts with a group of agents, it may no longer be necessary to divert money to third parties. But bonus pools nonetheless entail a cost of inefficient risk-sharing: agents are compensated on the basis of signals they cannot influence. We identify conditions under which optimal incentive contracts based on both subjective and objective performance indicators amount to *proper* bonus pools. Accordingly, the participating agents collectively always receive the entire budgeted amount, which varies with the realization of the objective metrics, and the split of the bonus pool is determined jointly by all objective and subjective performance indicators.

We find that the structure of optimal discretionary bonus pools is sensitive to the game-theoretic specification of the incentive constraints in multi-agent settings. Proper bonus pools emerge if the principal requires the desired effort levels to be merely a Nash equilibrium. In this case, the principal's desire to satisfy the agents' participation constraints is of primary importance. On balance, it is less expensive for the principal to accept the inefficient risk-sharing associated with proper bonus pools rather than divert money to external parties. Put differently, if each agent becomes a budget breaker for the other agent, then the compensation schemes will become riskier, yet average total compensation will be lowered.[6] The resulting incentive schemes, however, may be vulnerable to the presence of an alternative equilibrium under which both agents "shirk" and yet both are better off than under the obedient equilibrium. If the principal seeks to overcome this problem by providing each agent with a dominant strategy to take the desired action, we find that the resulting bonus pool arrangement resembles that in the single-agent scenario: the principal threatens to divert part of the bonus pool, but *only* in case all objective and subjective performance indicators assume their lowest possible outcome.[7]

We find that the game-theoretic solution concept, i.e., dominant strategies versus Nash equilibrium, is also crucial in predicting whether incentive schemes exhibit compression with two or more agents. If the desired action choices are merely required to form a Nash equilibrium, then an agent's compensation scheme will generally be fully differentiated. That is, holding fixed the signal realization for one agent, the other agent's compensation scheme will assume as many different levels as there are signals reflecting on that agent's performance, be they objective or subjective. In contrast, the requirement of dominant strategies is shown to result in partially compressed incentive schemes that do not differentiate between multiple subjective outcomes

The very nature of bonus pools implies a form of relative performance evaluation (RPE) with regard to the subjective metrics. For instance, two symmetric agents with identical objective outcomes will be paid the same regardless of whether the subjective outcomes for both are favorable or unfavorable. At the same time, each agent's share of the bonus pool increases if his own subjective outcome remains unchanged but that of the other agent declines. Somewhat surprisingly, we also establish a need for interdependent payoffs with regard to the objective metrics, despite our assumption that the agents' signals exhibit stochastic independence. Intuitively, this occurs as a consequence of two interacting properties: the bonus pools are monotonically increasing in each objective metric and, at the same time, the principal seeks to punish an agent exhibiting poor performance on all indicators. Starting with unfavorable subjective outcomes, the balancing requirement of bonus pools then implies that if one agent's objective signal becomes unfavorable, another agent receives higher compensation as a result.

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[6] Budget balancing is generally not an issue in principal-agent models where the principal is the residual claimant, unless the presence of subjective information makes it essential and costly for the principal to commit to a balanced mechanism, i.e., a bonus pool, in order to make an implicit contract credible. Several branches of the economics literature have studied the implications of budget balancing constraints for incentives in organizations. Starting with the design of public choice mechanisms (Green and Laffont 1979), subsequent studies have examined the balancing constraints of partnerships, e.g., Holmstrom (1982), Huddart and Liang (2005) and Baliga and Sjostrom, forthcoming.

[7] The notion of "burning" money by paying it to third parties does not seem to have much institutional support. Overall, our results suggest that such wasteful spending can be viewed effectively as an "off equilibrium" threat as this option will be exercised only in extreme cases. One way for the principal to divert money to third parties is to include additional individuals in the bonus pool who do not require incentive provisions and whose compensation is already sufficient without any payouts from the bonus pool.

The analysis in this paper is closely related to some of our prior work. Baiman and Rajan (1995) show in the context of a binary, two-agent setting that a principal can profitably incorporate unverifiable information about one agent by setting up a bonus pool. We extend that work by deriving conditions under which proper bonus pools are indeed optimal in general single- and multi-agent settings with objective and subjective information, and also fully characterize the efficient usage of subjective signals for performance evaluation. The primary conclusion in Rajan and Reichelstein (2006) is that the relative cost associated with subjective performance indicators declines as the number of agents covered by a bonus pool increases. The analysis in that paper focuses on multi-agent settings, and allows for both objective and subjective information only in the context of a LEN model. As we show later, the restrictions implied by the LEN framework preclude analysis of several of the issues that are central to this paper.

The remainder of the paper is organized as follows. The next section provides necessary and sufficient conditions for subjective information to be valuable. Compression of optimal incentive schemes is examined in Section III. We extend the analysis to multiple agents in Section IV, and present conclusions and directions for future work in Section V.

II. VALUE OF SUBJECTIVE INFORMATION

Suppose a principal seeks to motivate an agent to take a given action, a^h. This action is more costly for the agent than "shirking," i.e., taking a less productive action a^l. To provide incentives, the principal can rely on an objective metric, x, and a subjective metric, y. We think of the objective metric as financial information that can be verified by third parties and, therefore, is contractible. In contrast, the subjective signal is not verifiable for contracting purposes. This signal may not be observed by the agent, possibly because it reflects direct observations by the principal or informal reports from other sources.[8]

In the simplest case, both signals are binary and either signal realization is "high" or "low." Naturally, a high outcome suggests greater effort on the part of the agent in the sense that:

$$p^h \equiv Prob[x = x^h|a = a^h] > p^l \equiv Prob[x = x^h|a = a^l], \text{ and}$$

$$q^h \equiv Prob[y = y^h|a = a^h] > q^l \equiv Prob[y = y^h|a = a^l].$$

We assume that x and y are independently distributed, conditional on the agent's action choice.

One way for the principal to make credible use of her subjective information is to specify a *bonus pool* for each of the two possible objective outcomes. If the subjective information is indicative of shirking on the part of the manager, the principal effectively threatens to punish the agent by diverting some or all of the amount budgeted for the specific objective outcome to a third party. Any such payment would be wasteful from the principal's perspective and would not benefit the agent. Since the owner has committed to paying out the entire bonus pool, it is credible that she will follow the course of action that is most efficient from an *ex ante* incentive point of view.[9] For a given objective outcome, x, the principal's implicit contract with the agent therefore specifies how the budgeted amount of money will be divided between the agent and the third party, depending on the realization of the subjective signal.

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[8] We discuss the precise information structure and the class of feasible mechanisms in more detail below.

We denote the bonus pools corresponding to the two states by w^h and w^l, respectively. Furthermore, the principal "promises" compensation payments $\vec{s} = (s^{hh}, s^{hl}, s^{lh}, s^{ll})$ which satisfy the inequalities $w^h \geq \max\{s^{hh}, s^{hl}\}$ and $w^l \geq \max\{s^{lh}, s^{ll}\}$. Any difference between the bonus pool w^j and the actual compensation payment s^{jk} is paid to the outside third party. The risk-averse agent is assumed to have additively separable preferences over wealth, $U(\cdot)$ and cost of effort, represented by $e(\cdot)$. His expected utility, exclusive of the cost of effort, is denoted by:

$$E[U(\vec{s})|a^h] \equiv [U(s^{hh})\cdot q^h + U(s^{hl})\cdot(1-q^h)]p^h + [U(s^{lh})\cdot q^h + U(s^{ll})\cdot(1-q^h)](1-p^h).$$

The principal's optimization problem then becomes:

$$\mathbf{P}_1\text{: } \min_{w^j, s^{jk}} [w^h\cdot p^h + w^l\cdot(1-p^h)]$$

subject to:

$$\text{(i) } E[U(\vec{s})|a^h] - e(a^h) \geq \overline{U},$$
$$\text{(ii) } E[U(\vec{s})|a^h] - e(a^h) \geq E[U(\vec{s})|a^l] - e(a^l),$$
$$\text{(iii) } w^j - s^{jk} \geq 0, \text{ for all } j, k.$$

Throughout the paper, we restrict attention to settings where the participation and incentive compatibility constraints bind, and the optimal compensation levels are in the interior of the domain of feasible payments to the agent(s). A variety of sufficient conditions on the monitoring technology and/or utility functions can be identified for this to be the case; see, for example, Grossman and Hart (1983) or MacLeod (2003).

The class of incentive mechanisms covered by $\mathbf{P}_1$ deserves comment. When y is nonverifiable information that is available to both the principal and the agent, the principal could resort to revelation mechanisms that condition on the objective outcomes and messages that the parties send regarding their subjective information. If both parties observe the non-verifiable signal y, then it is possible to construct such message games so that in some equilibria the principal's expected payoff is the same as it would have been had the non-verifiable information in fact been verifiable for contracting purposes (MacLeod 2003, Proposition 4). Such mechanisms are, however, necessarily afflicted by multiple equilibrium problems. To see this, it suffices to note that messages that form an equilibrium in one state (agent's action and signal realizations) also form an equilibrium in any other state, since the parties' preferences are not state dependent.

In many contexts of interest, the signal y will be genuinely subjective information in the sense that only the principal observes it. Applicable examples include direct observations or informal reports from various sources. In that case, message games cannot sustain any outcome beyond those attainable by the incentive schemes specified in $\mathbf{P}_1$. This follows from the observation that by the Revelation Principle equilibrium messages correspond to truthful reporting. Yet, if the principal is to report her observation truthfully, her payoff must be the same for all realizations of the subjective signal. Thus, the class of mechanisms considered in $\mathbf{P}_1$ entails no loss of generality if the signal y is genuinely subjective information that is accessible only to the principal but not to the agent.[10] An alternative justification for excluding message-based games is that the very factors that make the information contained in y non-verifiable for contracting purposes may also make it difficult (i.e., costly) to write a contract specifying outcomes depending on the parties' reports concerning the non-verifiable information. This argument appears particularly persuasive in connection with managerial effort.

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[9] One can think of the presence of the subjective signal as creating double moral hazard, as in Demski and Sappington (1993). Commitment to a discretionary bonus pool allows the principal to resolve her incentive problem.

Holmstrom (1979) has shown that given some signal, x, an additional signal, y, is valuable for contracting purposes if and only if y is informative (in a statistical sense) over and above the signal x. In our model, if hypothetically y were a verifiable and contractible signal, it would clearly be valuable due to the assumed stochastic independence of the two signals. In the following discussion we shall say that the subjective signal y *is not valuable conditional on the objective outcome* $x = x^j$, if the solution to $\mathbf{P}_1$ is such that $s^{jh} = s^{jl} = w^j$. Accordingly, we define the subjective signal as *not valuable* if it is not valuable for any $j \in \{l,h\}$.

It is readily seen that the subjective signal is valuable provided it is sufficiently informative. Suppose that the probabilities p^h, p^l, and q^l are held fixed, yet $q^h \rightarrow 1$. The principal can then ignore the objective metric for performance evaluation and offer the agent a fixed bonus pool of $U^{-1}\left(\bar{U} + \frac{e(a^h)(1 - q^l) - e(a^l)(1 - q^h)}{(q^h - q^l)}\right)$. The entire amount is paid to the agent if the subjective metric results in a favorable outcome; otherwise, a fraction is diverted to the outside third party, and the agent receives the rest, $U^{-1}\left(\bar{U} - \frac{e(a^h)q^l - e(a^l)q^h}{(q^h - q^l)}\right)$. It is clear that these payoffs satisfy the agent's incentive compatibility and participation constraints. Moreover, as $q^h \rightarrow 1$, the resulting contract entails no risk for the agent and converges to the first-best solution.

For less extreme values of q^h, it is not evident that subjective signals can be used for contracting purposes. In stating the following result, we adopt the notation: $Q \equiv \frac{1 - q^l}{1 - q^h}$ and $P \equiv \frac{1 - p^h}{1 - p^l}$ and $V(z) \equiv \frac{d}{dz} U^{-1}(z)$.[11]

Proposition 1: The subjective metric is valuable if and only if:

$$\frac{Q - \frac{p^l}{p^h} \cdot P}{Q - 1} < \frac{V\left(\bar{U} + \frac{e(a^h)(1 - p^l) - e(a^l)(1 - p^h)}{(p^h - p^l)}\right)}{V\left(\bar{U} - \frac{e(a^h)p^l - e(a^l)p^h}{(p^h - p^l)}\right)}. \qquad (1)$$

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[10] Such a setting is analyzed in Ray (2007), who studies the principal's incentives to disclose his private knowledge of the agent's ability.

[11] All proofs are contained in the Appendix.

Proposition 1 says that the standard reasoning of informative signals being valuable does not apply to subjective information. In order to use such information credibly, the principal incurs an additional cost represented by the need to divert parts of the bonus pool to a third party with positive probability. The nature of this cost is such that if the condition identified in Proposition 1 is not met, the principal will prefer a "corner solution" that ignores the subjective signal entirely rather than lower the weight placed to this signal.

We provide mathematical intuition for the inequality in (1) by examining the extreme cases. Note first that both sides of the inequality exceed 1. The left-hand side represents a measure of the relative strength of the two signals, while the right-hand side is independent of q^h and q^l. Holding p^h and p^l fixed, consistent with our observations above, the subjective metric is valuable when $q^h \rightarrow 1$ since the left-hand side approaches 1, while the other side remains fixed at some value exceeding 1. Conversely, the inequality in (1) is not satisfied if the subjective signal is of poor quality in the sense that q^h is close to q^l; in that case, Q approaches 1 and the left-hand side becomes arbitrarily large. The value of subjective information also depends on the severity of the agency problem. If the moral hazard problem is not significant, i.e., $e(a^h) \rightarrow e(a^l)$, then the right-hand side approaches 1 (as both the numerator and denominator converge to $V(\overline{U} + e(a^l))$, and subjective information is of no value. However, once $e(a^h) - e(a^l)$ exceeds some threshold, the subjective signal y becomes useful. Finally, to discern the role of the quality of the objective metric, x, we can normalize $e(a^l)$ to equal 0. It is evident then that a less informative objective measure, as measured by a smaller spread in signal probabilities, $p^h - p^l$, makes it easier for (1) to hold. Alternatively, if the objective signal is sufficiently precise, it renders the subjective metric worthless even if the latter is marginally informative about the agent's effort choice.[12]

An intuitive explanation of Proposition 1 is that the principal seeks a compensation scheme that meets the agent's reservation constraint with equality. Any use of subjective information implies a diversion of resources away from this goal. Accordingly, the principal employs the subjective information only if it yields a sufficiently high benefit from improved risk-sharing. The inequality in (1) weighs the incremental information quality of the subjective signal (compared to that provided by the objective metric) against the agent's relative marginal utility at the compensation levels that would prevail if only objective information were used. The condition thus takes into account both the severity of the extant agency problem and the nature of the agent's preferences. When the inequality is violated, the principal's gains from better risk-sharing are outweighed by the additional compensation needed to meet the agent's participation constraint to cover for the eventualities where subjective information does come into play.

III. COMPRESSION OF INCENTIVE CONTRACTS

A continuing challenge for contract theory is that incentive schemes observed in practice tend to be simpler than those predicted by principal-agent models. One explanation for this discrepancy is that existing models usually do not account for the costs of writing, understanding, and implementing more "complex" contracts. A natural measure of contract complexity is the number of contingencies specified by the contract.[13] Accordingly, a simpler contract pools a larger set of input variables (signal realizations) and assigns them the same outcome (compensation level). From that perspective, a dichotomous bonus scheme would be the simplest possible incentive scheme. One obvious advantage of such schemes is that it will generally not be necessary to verify the exact signal realization.

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[12] Baker et al. (1994) derive a related result, albeit in a very different setting. In some specifications of their infinite-period model, the objective performance indicators are sufficiently reliable so as to render implicit incentives based on subjective variables impossible. This reflects that deviating from the behavior prescribed by implicit incentives becomes more attractive if subsequent outcomes, driven exclusively by explicit incentives, are relatively efficient.

MacLeod (2003) has shown that when a principal can only rely on subjective information to evaluate an agent's actions, the optimal incentive scheme will be "compressed." Specifically, the agent always receives the entire bonus amount except when the lowest possible outcome is realized, in which case the bonus pool is entirely diverted to the third party. This result, which only requires the familiar monotone likelihood ratio property (MLRP), highlights the incremental cost of subjective information. If the subjective information were in fact verifiable for contracting purposes, the principal would find it optimal to employ a monotone increasing compensation scheme. In contrast, with subjective information the entire bonus pool must be paid out anyhow and, therefore, the cheapest incentive provision is a "stick" approach that punishes only extremely low performance.

An immediate question then is whether similar compression results emerge in settings where the principal has access to both objective and subjective performance indicators. Proposition 1 above identifies conditions under which the optimal incentive scheme will indeed be compressed. The reason is that if inequality (1) does not hold, the optimal incentive scheme entails only two distinct levels of compensation even though there are four different (and informative) signal realizations. We now show that even when inequality (1) is satisfied and the subjective signal has value, it will be used more coarsely than if it were verifiable information. For expositional reasons, we first confine attention to the binary outcome setting introduced in the previous section and then present a generalized model with finitely many signal outcomes.

Observation 1: The solution to $\mathbf{P}_1$ is such that the subjective metric has no value whenever the objective outcome is favorable, that is, $w^h = s^{hh} = s^{hl}$.

This feature of the optimal contract is derived as part of the proof of Proposition 1. Intuitively, it is always efficient for the principal to motivate a risk-averse agent by marginally lowering the bonus pool for the x^l outcome than to "throw away" money by paying him less for (x^h, y^l) than for (x^h, y^h). To the contrary, if $s^{hl} < s^{hh} = w^h$, then the principal can increase s^{hl} while reducing w^l, leading to a lower compensation expense. Given MLRP, this variation can be shown to still implement the targeted action and satisfy the agent's participation constraint. Thus the principal prefers to compress the compensation scheme for the favorable objective outcome and reserves the "stick" of withholding part of the bonus pool for the less favorable outcome.

If condition (1) in Proposition 1 is satisfied, the subjective metric is not used for evaluating the agent when $x = x^h$. Yet, the presence of the subjective metric alters the optimal compensation scheme. In particular, it can be shown that the agent is paid less for $x = x^h$ than under the optimal contract when only x is available for contracting. On the other hand, the amount set aside by the principal when $x = x^l$ is always *higher* than the second-best compensation for that outcome realization. In other words, there is compression in both the use of the subjective measure, as well as an induced compression in the payout levels based on the objective measure. As further illustration of the latter, it is possible that even the lowest payoff received by the agent, s^{ll}, could exceed the optimal second-best pay for $x = x^l$.[14]

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[13] Earlier literature has formalized related notions of costly contracting; see Dye (1985), Melumad et al. (1997), and Laffont and Martimort (2001) on this point.

Table 1 illustrates the above results via a numerical example that we will draw on for the rest of the paper. Suppose that: $U(s) = \frac{5}{3} \cdot s^{0.6}$; $e(a^h) = 3$; $e(a^l) = 0$; $p^h = q^h = 0.7$; $p^l = q^l = 0.3$; and $\bar{U} = 6$. It is easy to verify that this agency problem satisfies inequality (1), i.e., subjective information is of value to the principal.[15] The first column in Table 1 provides the optimal compensation scheme for the agent when signal y is unavailable, while the second column shows the second-best payoffs when y can be used for explicit contracting. The third column depicts the optimal payoffs under the bonus pool mechanism when y represents subjective information. The last row of the table shows the principal's expected cost in each of these settings.

To generalize our findings in connection with Observation 1, we now consider a more general outcome structure in which there are n possible values for both the objective and the subjective metric. As before, we maintain the assumption that, conditional on a, the two signals are statistically independent. Specifically:

$$Prob[x = x^j, y = y^k | a] = p^j(a) \cdot q^k(a).$$

Throughout our analysis both $p^j(a)$ and $q^k(a)$ are assumed to satisfy the MLRP condition, i.e., $\frac{p^j(a^l)}{p^j(a^h)}$ and $\frac{q^k(a^l)}{q^k(a^h)}$ are strictly decreasing in j and k, respectively. The principal seeks to implement the higher action, a^h, at minimal cost, by choosing n bonus pool values, one for each objective outcome, and a total of n^2 possible compensation levels, $\vec{s} = (\{s^{jk}\}_{j=1}^{n}{}_{k=1}^{n})$.

TABLE 1
Optimal Compensation with Binary Objective and Subjective Measures

	Signal y Unavailable	Signal y Verifiable	Signal y Subjective
s^{hh}	24.11	20.63	22.66
s^{hl}	24.11	16.27	22.66
s^{lh}	3.86	16.27	6.87
s^{ll}	3.86	2.30	3.18
Expected cost	18.04	17.15	17.92

This table presents the optimal compensation payments for an agency problem with an available binary objective metric, $x \in \{l,h\}$, and a second informative measure, $y \in \{l,h\}$, under various assumptions regarding the availability and verifiability of y.

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[14] A necessary and sufficient condition for this to occur is that the signal probabilities satisfy the following inequality: $p^h(1 - p^l)(1 - q^l) - p^l(1 - p^h)(1 - q^h) \geq (p^h - p^l)$. Intuitively, this holds if either the objective metric is not very informative or the subjective metric is highly informative about the agent's action choice.

[15] The example does not, however, satisfy the inequality in the previous footnote.

$$\mathbf{P}_2\colon \min_{w^j, s^{jk}} \sum_{j=1}^{n} w^j \cdot p^j(a^h)$$

subject to:

$$\text{(i)}\ E[U(\tilde{s})|a^h] - e(a^h) \geq \overline{U}$$
$$\text{(ii)}\ E[U(\tilde{s})|a^h] - e(a^h) \geq E[U(\tilde{s})|a^l] - e(a^l)$$
$$\text{(iii)}\ w^j - s^{jk} \leq 0, \text{ for all } j, k.$$

The following result characterizing the optimal solution to program $\mathbf{P}_2$.

Proposition 2: The subjective metric has no value unless the lowest possible outcome of the objective metric is realized. If $x = x^1$, then the subjective metric is used only if it also takes on the lowest possible realization, $y = y^1$.

The finding that the subjective metric is never of value unless $x = x^1$ directly extends our finding in Observation 1 above. Any bonus pool arrangement corresponding to x^j for $j > 1$ could be improved upon by raising the compensation payments corresponding to all realizations of the subjective metric other than y^n. At the same time the principal could lower the entire bonus pool corresponding to x^1. If the subjective metric is used at all when $x = x^1$, then there is further compression—the bonus pool, w^1, is paid out in full to the agent for all subjective outcomes unless $y = y^1$. As a consequence, the principal diverts money to a third party only in the "unlikely" event that both metrics result in the lowest possible outcome. Table 2 provides a stylized illustration of the "grid" of effective payoffs to the agent.

We can measure the degree of compression of an incentive scheme by the number of distinct compensation levels received by the agent. Formally, let $|\tilde{s}|$ be the size of the range of $\tilde{s}$. If both metrics were in fact objective and verifiable, then optimal incentive contracts would generally entail no compression in the sense that $|\tilde{s}| = n^2$.[16] With a subjective signal,

TABLE 2
Payment Grid with Finite Possible Outcomes for Objective and Subjective Measures

		Subjective Indicator				
		y^n	y^n	...	y^2	y^1
Objective Indicator	x^n	w^n	w^n	...	w^n	w^n
	x^{n-1}	w^{n-1}	w^{n-1}	...	w^{n-1}	w^{n-1}
	$\vdots$	$\vdots$	$\vdots$	$\ddots$	$\vdots$	$\vdots$
	x^2	w^2	w^2	...	w^2	w^2
	x^1	w^1	w^1	...	w^1	$w^1 - \delta$

This table presents the optimal payment grid for a generic agency problem with a discrete objective metric, $x \in \{x^1, x^2,...,x^n\}$, and a discrete subjective measure, $y \in \{y^1, y^2,...,y^n\}$. Note that $\delta \geq 0$, and so there are *at most* $(n+1)$ distinct payoffs, relative to a possible total of n^2 different outcomes.

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[16] In particular, the only setting in which the number of distinct payoff levels would fall below n^2 is if there were two separate signal realizations for which the sum of the likelihood ratios at the optimal action happens to coincide (as is the case in the example in Table 1). Moreover, even in this situation, the principal would need to know the realizations of both signals in order to compute the payoff level for the agent.

Proposition 2 states that the optimal incentive scheme instead satisfies $|\vec{s}| \leq n + 1$, with $|s^{zk}| = 1$ for $2 \leq z \leq n$ and $|s^{1k}| \leq 2$. An immediate implication is that the presence of objective measures leads to "super-compression" in the use of information for performance evaluation. In particular, when only subjective signals are available for contracting, MacLeod (2003, Proposition 6) has shown that the entire bonus pool is paid out unless the subjective metric assumes the lowest possible outcome, i.e., n signals are reduced to two possible payoffs. With both objective and subjective measures, there are *at most* $(n + 1)$ payoffs out of n^2 possible signal realizations, which, for any $n > 1$, represents a greater relative level of compression $\left(\text{as } \frac{n+1}{n^2} < \frac{2}{n}\right)$.

The result in Proposition 2 predicts a lexicographic use of objective and subjective performance indicators, which has conceptual parallels to the notion of conditional variance investigations, as articulated in management accounting textbooks (Horngren et al. 2008, Chap. 7). Accordingly, a supervisor relies on additional information only if a first investigation yields an outcome below a certain threshold level. Agency models that have analyzed variance investigation policies include Baiman and Demski (1980), Dye (1986) and, more recently, Fagart and Sinclair-Desgagne (2007). In these models, the principal commits in advance to incur a cost to generate an additional verifiable signal, y, conditional on the realization of an initially informative signal, x. We note that in these models the additional information is *costly to acquire*, while in the context of our model the subjective signal is *costly to use* due to the inherent balancing constraint inherent in bonus pools.

A primary issue of interest for agency models examining conditional variance investigations is whether the principal employs a lower-tailed investigation policy. Lambert (1985) and Young (1986) demonstrate that this result depends crucially on the correlation structure across the two signals, as well as the assumed utility function for the agent. This characterization is broadly consistent with Proposition 1, which presents a necessary and sufficient condition for the use of the second (subjective) signal in terms of the agent's utility function and the underlying probabilities. More specifically, Proposition 2 finds that the second, independent (subjective) signal will not be used unless the objective outcome is "unacceptable." However, in a variant of our model in which the two signals are no longer independent conditional on the agent's action, Ederhof (2008) finds that a principal may rely on the subjective metric whenever the objective performance indicators fall outside some normal range.[17] Such a result corresponds to the notion of a two-sided investigation strategy (Young 1986). Christensen and Feltham (2005, Chap. 18) prove that the gross benefit of a conditional investigation depends on the agent's degree of risk cautiousness (assuming HARA utility).[18] It can be shown that the right-hand side of the inequality in Proposition 1 is a decreasing function of the agent's level of risk cautiousness, provided the optimal levels of compensation are nonnegative. As such, lower levels of risk cautiousness, which are associated with the optimality of lower-tailed monitoring, are precisely those for which it is also efficient to employ subjective information to punish the agent when the objective measures suggest poor performance.

To conclude the analysis of the single-agent setting, we note that our analysis thus far extends readily to scenarios where the agent must choose his effort from a continuum of possibilities, provided only that the first-order approach for specifying the agent's incentive constraint is valid. Earlier literature has specified a variety of sufficient conditions ensuring the validity of this approach (e.g., Jewitt 1988; Sinclair-Desgagne 1994). In the context of our model, one such sufficient condition is that the agent's action determines a convex combination of two given densities (MacLeod 2003).

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[17] Ederhof (2008) also obtains empirical support for this hypothesis.

[18] We are grateful to an anonymous reviewer for encouraging us to pursue this connection.

IV. MULTIPLE AGENTS

The preceding analysis naturally raises the question whether the above findings extend to settings in which the principal contracts with a group of agents. Intuitively, the addition of agents should ease the constraints imposed by subjective information, as the principal now has the flexibility of using the bonus pool to pay more to other agents if the subjective outcome for a specific agent is unfavorable. Accepting the intuition that the budget-balancing constraint inherent in bonus pools is relaxed in the presence of multiple agents, it is plausible that, in contrast to Proposition 1, the principal will never find it advantageous to ignore the subjective signal, or even to compress an agent's incentive scheme (as in Proposition 2). In addition, the very nature of bonus pool arrangements creates interdependencies in the agents' compensation. Our analysis explores the implications of subjective information for relative performance evaluation, and shows that the nature of the optimal discretionary payouts is sensitive to the specification of the game-theoretic solution concept.

Throughout this section, we shall confine attention to a setting with two agents in order to economize on notation. We index the agents by subscript i, $i = 1, 2$ and denote their obedient and disobedient actions by a_i^h and a_i^l, respectively. The objective and subjective signals on agent 1's performance are given by (x_1^j, y_1^k) for $1 \leq j, k \leq n$, as before, while the corresponding signals on agent 2's performance are given by (x_2^u, y_2^v) for $1 \leq u, v \leq n$. We focus on a setting in which the signals the principal obtains are stochastically independent across agents. Therefore, their compensation schemes would be independent of each other if all signals were objective and verifiable. Specifically, we assume that the joint distribution of the four signals is as follows:

$$Prob[x_1 = x_1^j, y_1 = y_1^k, x_2 = x_2^u, y_2 = y_2^v | a_1, a_2] = p_1^j(a_1) \cdot q_1^k(a_1) \cdot p_2^u(a_2) \cdot q_2^v(a_2).$$

Bonus pools can now be indexed to the objective outcome pair (x_1^j, x_2^u) for $1 \leq j, u \leq n$. Accordingly, we use the notation w^{ju}. Agent i's compensation scheme takes the form $\vec{s}_i = (\{s_i(x_1^j, y_1^k, x_2^u, y_2^v)\})$. The principal seeks to design implicit incentive schemes that minimize the expected bonus pool compensation subject to incentive and participation constraints.

Nash Implementation

We first require the targeted effort levels, a_i^h, to constitute a Nash equilibrium, such that in equilibrium the participation constraints are met.[19]

$$\mathbf{P}_3\text{:} \min_{w^{ju}, s_i(\cdot)} \sum_{j=1}^{n} \sum_{u=1}^{n} w^{ju} \cdot p_1^j(a_1^h) \cdot p_2^u(a_2^h)$$

subject to: for $1 \leq i \leq 2$,

$$\text{(i) } E[U_i(\vec{s}_i | a_i^h, a_{-i}^h)] - e_i(a_i^h) \geq U_i$$
$$\text{(ii) } E[U_i(\vec{s}_i | a_i^h, a_{-i}^h)] - e_i(a_i^h) \geq E[U_i(\vec{s}_i | a_i^l, a_{-i}^h)] - e_i(a_i^l)$$
$$\text{(iii) } w^{ju} - s_1(x_1^j, y_1^k, x_2^u, y_2^v) - s_2(x_1^j, y_1^k, x_2^u, y_2^v) \geq 0 \text{ for all } 1 \leq j, k, u, v \leq n.$$

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[19] In stating $\mathbf{P}_3$, we use the common notation "$-i$" to denote the agent who is not i.

One feasible solution to the principal's problem in $\mathbf{P}_3$ is to replicate the optimal single-agent contract. The advantage of this solution is that neither agent is burdened with unnecessary risk resulting from the variation in the signals that pertain to the other agent's action. On the other hand, the principal can potentially use each agent as a "budget breaker" by interlinking the two compensation schemes. A bonus pool is said to be proper if the inequality in (iii) in $\mathbf{P}_3$ is satisfied as an equality for all objective and subjective outcomes; that is, for any objective outcome (x_1^j, x_2^u), the entire bonus pool w^{ju} is paid out to the two agents.

Proposition 3: If the agents' actions are required to be a Nash equilibrium, an optimal incentive scheme specifies proper bonus pools for all objective outcomes.

This result generalizes a finding in Rajan and Reichelstein (2006, Proposition 1) to settings with both objective and subjective performance indicators. On balance, it is less expensive for the principal to accept the inefficient risk-sharing associated with proper bonus pools rather than wasting money that is paid to external parties. Put differently, if each agent becomes a budget breaker for the other agent, the compensation schemes will become riskier yet average total compensation will be lowered. The result is consistent with recent experimental work by Fisher et al. (2005), who demonstrate the benefits of having a formula-based total bonus pool and allowing the employer discretion to then allocate it across employees.[20]

We next examine the structure of optimal bonus pool arrangements. While subjective information remains costly relative to the benchmark of verifiable performance indicators, the addition of one or more agents may lower the associated cost. It is therefore natural to ask whether in multi-agent settings subjective metrics may again have no additional value over and above a given set of objective metrics. Related to this question are the issues of monotonicity and compression of an agent's incentive scheme. These questions can be posed not only with regard to each agent's own performance indicators, but also with regard to those generated by the other agent.

Proposition 4: A solution to $\mathbf{P}_3$ has the following properties:

(i) The bonus pools w^{ju} are strictly increasing in each of the objective metrics x_1^j and x_2^u;
(ii) Each agent's compensation strictly increases in both his objective and subjective metric;
(iii) Each agent's compensation is strictly decreasing in the other agent's subjective metric;
(iv) Neither agent's compensation is monotonic in the other agent's objective outcome.

The first finding in Proposition 4 is consistent with the observation that in practice the magnitude of bonus pools is usually tied to underlying financial (and verifiable) metrics such as earnings per share, ROA, or Economic Value Added (EVA). Part (ii) shows that Proposition 1 does not extend to multiple agents. Once another agent can serve as a "budget breaker," the subjective metric is always valuable for contracting purposes, regardless of the objective outcome. Given our earlier result that it is optimal for bonus pools to be proper, the finding in part (iii) of Proposition 4 follows from the finding in the latter part of (ii). Specifically, the principal must engage in relative performance evaluation (RPE) with regard to the subjective metrics. For instance, in case of two symmetric agents, the balancing constraints imply that both will be paid the same regardless of whether both subjective metrics reveal favorable or unfavorable outcomes. The bonus pool creates effective incentives by offering "large" rewards to an agent whose subjective outcome is favorable in contrast to that of the other agent.

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[20] For another recent experimental study of the effectiveness of discretionary bonus plans, see Bailey et al. (2006).

With regard to the finding in part (iv), we note that linked payoffs of any kind related to the objective metrics would not be desirable absent subjective information since all signals are stochastically independent. However, the interdependence in payoffs inherent in any bonus pool arrangement effectively spills over to the objective metrics as well. Moreover, it is not optimal to punish an agent if the other agent's objective measure increases, as might be suggested by naïve notions of RPE. Instead, the optimal contract exhibits both positive and negative affiliations between the outcome of one agent's objective metric and another agent's compensation.

Proposition 4 can be illustrated by the following extension of the example introduced in Section III. Consider the first agent to be the replica of the one in the example. The second agent is almost identical, with the exception that $U_2(s_2) = \frac{5}{4} \cdot s^{0.8}$ and $\overline{U}_2 = 9$.[21] Table 3 then displays the optimal bonus pool arrangement. Consistent with Proposition 4, the total bonus pool increases in the objective measures, and the bonus paid to each agent is monotone increasing in his own objective and subjective metrics, yet decreasing in the other agent's subjective metric.

The change in agent 1's compensation with regard to agent 2's objective measure, x_2, depends on the reference point with regard to y_2. If $y_2 = y_2^h$ and agent 2's objective outcome drops from x_2^h to x_2^l, then both agents receive lower compensation because the bonus pool shrinks with the drop in x_2 (make pairwise comparisons of the payoffs in column 3 and those in column 1). On the other hand, if x_2 drops from x_2^h to x_2^l when $y_2 = y_2^l$, then agent 2's performance is revealed as poor on both objective and subjective indicators. It is efficient for the principal to punish agent 2 severely for such outcomes, but to do so within the constraints of a bonus pool, agent 1 must be paid more (to see this, compare the payoffs in

TABLE 3
Optimal Bonus Pools and Compensation Levels with Multiple Agents

		Bonus Pools			
		$w^{hh} = 38.80$	$w^{hl} = 31.39$	$w^{lh} = 31.15$	$w^{ll} = 23.53$
		Agent 2's Outcomes			
		h, h	***h, l***	***l, h***	***l, l***
Agent 1's Outcomes	***h, h***	(20.23, 18.57)	(21.69, 17.11)	(18.69, 12.71)	(25.60, 5.79)
	h, l	(16.97, 21.83)	(18.35, 20.45)	(15.95, 15.45)	(23.35, 8.05)
	l, h	(14.72, 16.43)	(15.86, 15.29)	(13.10, 10.43)	(18.48, 5.04)
	l, l	(2.13, 29.02)	(2.37, 28.78)	(2.05, 21.48)	(3.97, 19.56)
		Compensation to (Agent 1, Agent 2)			

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[21] We have chosen the agents to be non-identical in order to avoid issues of multiple equilibria. We explore this issue at greater depth later in this section.

column 4 to those in column 2). Our findings demonstrate the subtle nature of the shifts in an agent's compensation based on the realizations of another agent's performance metric. These theoretical findings should prove useful for empirical tests of relative performance evaluation in firms and industries where discretionary bonuses based on subjective information are a significant factor.[22]

An immediate consequence of parts (ii) and (iii) in Proposition 4 is that the earlier super-compression result (Proposition 2) does not carry over to multi-agent settings. In fact, Table 3 reveals that each agent's compensation scheme is fully differentiated in that $|s_i(x_1^j, y_1^k, x_2^u, y_2^v)| = 2^4 = 16$. Thus we conclude that, when the game-theoretic concept is Nash implementation, the relative cost associated with subjectivity is sufficiently reduced in multi-agent settings so that the principal no longer ignores any of the available information signals for compensation purposes.

Dominant Strategy Implementation

For multi-agent incentive schemes that implement desired outcomes in Nash equilibrium strategies, there is frequently concern about the agents' ability to find the prescribed equilibrium, in particular if there are multiple such equilibria. In the context of our model, it is instructive to consider the example shown in Table 3. It is easily verified that choosing high effort is a dominant strategy for agent 1 and a best response for agent 2. Thus, the principal obtains a stronger version of the incentive compatibility constraint "for free" in this example.[23] Unfortunately, this observation does not extend generally to the class of contracting problems considered in this paper. In fact, if the preceding example is altered so that the second agent has the square root utility function $U_2(s_2) = 2 \cdot \sqrt{s_2}$, then it can be verified that choosing high effort is merely a Nash equilibrium for both agents and furthermore this equilibrium is Pareto-dominated from the agents' perspective by another equilibrium in which each exerts the low effort level.[24]

One possible solution to the multiple-equilibrium problem is to augment the agents' strategy sets so as to incorporate message-sending in addition to the choice of effort levels (Ma 1988; Arya and Glover 1996). Such games have, however, been criticized on account of their considerable complexity. In keeping with our general approach of excluding incentive mechanisms based on message-sending games, we adopt the approach of Demski and Sappington (1984), which strengthens the incentive constraints. Specifically, we impose the requirement that the desired action choices become dominant strategies for both agents.[25]

Given the independence of the production technologies and outcome signals of the agents, one might suspect that the efficient dominant strategy incentive scheme reverts to giving each agent his optimal second-best contract with subjective information (i.e., the grid outlined in Table 2). Alternatively, Proposition 3 also suggests the possibility that the use of proper bonus pools continues to be optimal when the incentive constraints for both agents are strengthened. Surprisingly, the efficient solution turns out to be neither of these possibilities.

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[22] To date, empirical studies have confined attention to CEO-level data and have found little evidence for the use of RPE across firms (Albuquerque 2006). Our findings predict that for studies at the divisional or business unit level within firms, the presence of subjective information will imply that a monotonic association will not be found between one division's financial performance and the compensation of another division's manager.

[23] The possibility of costless dominant strategy implementations has been observed for a variety of mechanism design problems, mostly with risk-neutral agents; see, for instance, Mookherjee and Reichelstein (1990) or Arya et al. (2007). In the context of our model, it appears that the requirement of dominant strategies for *all* agents is generally costly to the principal.

[24] In future research, it would be desirable to explore the conditions under which this implementation problem arises. Numerical examples suggest that settings with symmetric agents are more susceptible to multiple equilibrium problems.

[25] Demski and Sappington (1984) specify the constraint that one agent has a dominant strategy incentive, while for the other agent the desired action choice is merely a Nash best response. Propositions 3–6 indicate that the requirement of Nash equilibrium strategies leads to somewhat different results regarding the optimal structure of bonus pools than the requirement of dominant strategies for both agents. It remains to be seen in future research what findings emerge for the "hybrid" solution concept in which the targeted actions are a dominant strategy for one agent and a best response for the other agent.

> **Proposition 5:** An optimal dominant strategy incentive scheme specifies proper bonus pools whenever at least one objective metric exceeds the least favorable realization. If both objective metrics record their lowest realization, the bonus pool is also fully distributed among the agents, with a possible exception occurring when both subjective measures also record their lowest realization.

We note that proper bonus pools may emerge for *all* outcomes under the optimal dominant strategy scheme. To demonstrate this eventuality, consider the example reported in Table 3, where agent 1 could be given the dominant strategy incentive for free. It can be shown that the addition of another such constraint, for agent 2, is costly for the principal, yet bonus pools remain proper for all outcomes. More interestingly, Proposition 5 identifies the possibility that the implementation problem is so severe that an improper discretionary bonus pool is employed. In that case, the principal finds it beneficial to divert money to a third party, but only when all available performance indicators point to shirking by both agents. Paying part of the bonus pool w^{ll} to a third party is then an efficient way to inflict "collective punishment" on both agents. Note that this finding is analogous to the result established in Proposition 2, showing that with a single agent improper bonus pools can only result when both metrics assume the worst possible outcomes. In that sense, the dominant strategy requirement leads to more "separability" across the two agents, shifting the final solution toward the single-agent scenario.

To verify the possibility of improper bonus pools, as identified in Proposition 5, consider the previously described example where agent 2 has a square root utility function and $\overline{U}_2 = 9$. The resulting optimal incentive scheme is shown in Table 4.

Several aspects of Table 4 deserve comment. First, when all four signals take on their lowest realization, the pool is not paid out in full ($s_1^{llll} + s_2^{llll} = 12.39 + 13.56 = 25.95 < 33.25 = w^{ll}$). However, the other 15 signal realizations result in proper bonus pools as under Nash implementation. The intuition for these findings is that is generally wasteful to

TABLE 4

Optimal Bonus Pools and Compensation Levels under Dominant Strategy Implementation

		Bonus Pools			
		$w^{hh} = 61.86$	$w^{hl} = 46.61$	$w^{lh} = 55.56$	$w^{ll} = 33.25$
		Agent 2's Outcomes			
		h, h	***h, l***	***l, h***	***l, l***
Agent 1's Outcomes	***h, h***	(19.07, 42.78)	(22.75, 39.11)	(16.44, 30.16)	(38.18, 8.42)
	h, l	(15.84, 46.02)	(19.20, 42.66)	(13.82, 32.79)	(38.18, 8.42)
	l, h	(13.96, 41.60)	(16.95, 38.61)	(9.32, 23.93)	(26.89, 6.36)
	l, l	(1.96, 53.60)	(1.96, 53.60)	(1.04, 32.21)	(12.39, 13.56)

Compensation to (Agent 1, Agent 2)

divert part of the bonus pool to an outside party. Proper bonus pools help in this regard by shifting any excess compensation over to the other agent. Such budget balancing leads to implementation problems, however, since it restricts the amount by which disobedience by both agents can be punished—the money set aside must be apportioned between the agents even if both appear to have shirked. The efficient way to create dominant strategy incentives is thus to allow for money to be diverted to outside parties when, and only when, all signals indicate poor performance by both managers.

A noteworthy feature of the incentive scheme shown in Table 4 is that it is "mostly" differentiated, it does exhibit some compression. In particular, the entries in row 4, column 1 and row 4, column 2 are identical, as are the entries in row 1, column 4 and row 2, column 4. In other words, when one agent shows low performance in both metrics, the other agent's subjective measure is no longer used for compensation, provided the latter's (more trusted) objective measure is favorable. The next result shows that this observation is part of a more general pattern.

Proposition 6: If the bonus pool corresponding to the lowest possible objective outcome is not proper, the optimal dominant strategy incentive scheme exhibits partial compression. With n possible outcomes for each of the objective and the subjective metrics, the maximum number of distinct payoffs is $n^4 - 2n(n - 1) + 2$.

The proof of Proposition 6 establishes the precise manner in which compression occurs for general $n \geq 2$. For $n = 2$, the result predicts a maximum of 14 distinct payoffs for each agent, out of a possible 16. As demonstrated in the above numerical example, the bound is a tight one. For $n = 3$, the result predicts that at most 71 of the 81 possible payoffs for each agent will be distinct; again, we have constructed examples where this bound holds exactly. Taken together, these results indicate that optimal dominant strategy mechanisms are qualitatively in between the single agent case and the multi-agent Nash equilibrium solution.[26] The subjective metrics are never disregarded entirely with two or more agents. At the same time, the principal may divert part of the bonus pool to a third party if all objective and subjective metrics point to shirking by both agents. Optimal incentive schemes still exhibit compression; however, direct comparison with Proposition 2 shows less compression than in the single agent setting, as $\frac{n^4 - 2n(n-1) + 2}{n^4} > \frac{n+1}{n^2}$.

In concluding this section, we note that the findings in Propositions 3 and 4 can be extended to scenarios where each agent chooses from a continuum of possible effort levels, provided that the first-order approach is valid for each agent's incentive constraint. We also conjecture that most of the claims in Propositions 3 through 6 extend directly to settings with an arbitrary number of agents. However, the precise pattern of RPE for a group of n agents, specifically with regard to how an agent's compensation varies with the objective outcomes of the other $n - 1$ agents, remains open for further investigation.

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[26] Our findings here show that the use of the LEN framework to study subjective performance measures (as in Rajan and Reichelstein 2006) imposes important restrictions. First, with linear compensation schemes, any discretionary bonus schemes are constrained to be proper, i.e., the bonus pools must always be fully distributed across the agents. Second, linearity implies that the size of the discretionary bonus pool cannot vary with the realization of the objective metrics. Finally, the LEN framework makes it necessary to satisfy the incentive compatibility constraints in a dominant strategy sense, i.e., there is no distinction between Nash and dominant strategy implementation.

V. CONCLUDING REMARKS

To make credible use of subjective performance measures in short-term incentive contracts, a principal must commit to paying out an amount that is independent of the actual realization of the subjective metrics. The cost of such arrangements impacts the demand for and use of subjective performance indicators. When contracting with a single agent, it may be optimal to ignore an incrementally informative though non-verifiable signal. If such a signal is valuable for contracting purposes, we predict a lexicographic relation: the subjective metric is relevant only if the objective metric results in an unfavorable outcome and, even then, the subjective metric serves only to punish very poor performance. This finding is broadly consistent with the concept of conditional variance investigations as discussed in management accounting.

When the principal seeks to create incentives for a group of agents, the cost associated with subjective information is reduced. Optimal bonus pool arrangements result in inefficient risk-sharing, but no longer involve the dead-weight cost of diverting money to third parties for certain contingencies, i.e., bonus pools are proper. The presence of both subjective and objective signals for multiple agents gives rise to a complex pattern of interdependent payoffs that can lead to problems with ensuring implementation of the desired action profile. When more stringent incentive constraints are imposed to counteract this issue, the resulting incentive schemes amount to proper bonus pools, except in the extreme case where the principal seeks to punish the entire group of agents, when all performance indicators take on their worst possible realization.

Our analysis has confined attention to a setting in which, conditional on the agents' action choices, all signal realizations were drawn independently. In many contexts of interest, it is plausible that the signals are correlated, perhaps because of common shocks. As mentioned earlier, Ederhof (2008) shows that in a single-agent contracting problem, correlation between the objective and the subjective signal may change our prediction that the subjective metric is used only when the objective metric points to poor performance. For multi-agent contracting problems, Rajan and Reichelstein (2006) find that the principal can exploit positive correlations in the subjective metrics across agents, while negative correlations exacerbate the balancing constraint associated with bonus pools. However, these results were obtained in the context of a LEN model and, as such, may be inherently biased by the restriction to linear compensations.

There are several other promising directions for extending the present work on discretionary bonus pools. As noted above, the incentives in our one-period model rely on the principal's indifference about carrying out the terms of the implicit bonus pool arrangement. This indifference naturally invites influence activities by the agents. While one can argue that such activities will cancel each other in equilibrium, they nonetheless represent a hidden cost of bonus pool arrangements. In long-term relationships, it is plausible that the corresponding frictions will be diminished as the principal will also be motivated by reputation concerns.

In many firms, subjective information about the performance of individual managers is not directly available to the owners of the firm but such information may be obtainable by supervisors, such as the board of directors. Given the difficulty of communicating subjective information, the principal may need to delegate authority and provide supervisors with discretion in setting managerial bonuses. At the same time, supervisors have to be motivated to engage in effective monitoring (as well as to resist influence activities). It would be a material advance for the theory of organizational design to develop a model in which objective measures are used to motivate supervisory agents to gather subjective information on the performance of other agents.

APPENDIX

Proof of Proposition 1

We proceed by first characterizing the solution to program $\mathbf{P}_1$. Let λ and μ denote the multipliers for constraints (i) and (ii) respectively. Denote by β^{jk} the multiplier for the constraint $w^j - s^{jk} \geq 0$ (there are four such inequalities embedded in constraint (iii)). The first-order conditions for the optimal solution with regard to w^h and w^ℓ are:

$$-p^h + \beta^{hh} + \beta^{hl} = 0 \tag{2}$$

$$-(1 - p^h) + \beta^{lh} + \beta^{ll} = 0. \tag{3}$$

Similarly, the first-order conditions for the optimal compensation levels are:

$$\lambda \cdot p^h \cdot q^h U'(s^{hh}) + \mu \cdot [p^h \cdot q^h - p^l \cdot q^l] \cdot U'(s^{hh}) - \beta^{hh} = 0; \tag{4}$$

$$\begin{aligned}&\lambda \cdot p^h \cdot (1 - q^h) U'(s^{hl}) + \mu \cdot [p^h \cdot (1 - q^h) - p^l \cdot (1 - q^l)] \cdot U'(s^{hl})\\&\quad - \beta^{hl} = 0;\end{aligned} \tag{5}$$

$$\lambda \cdot (1 - p^h) \cdot q^h \cdot U'(s^{lh}) + \mu \cdot [q^h(1 - p^h) - q^l(1 - p^l)] \cdot U'(s^{lh}) - \beta^{lh} = 0; \tag{6}$$

$$\begin{aligned}&\lambda \cdot (1 - p^h) \cdot (1 - q^h) \cdot U'(s^{ll}) + \mu \cdot [(1 - p^h) \cdot (1 - q^h)\\&\quad - (1 - p^l) \cdot (1 - q^l)] \cdot U'(s^{ll}) - \beta^{ll} = 0.\end{aligned} \tag{7}$$

Since constraint (ii) is an inequality, the associated multiplier μ is non-negative. For a nontrivial agency problem, it is evident that $\mu > 0$ and we will take that as given hence. Now, note that from (4) and (5), and $q^l < q^h$:

$$\begin{aligned}\frac{\beta^{hh}}{p^h \cdot q^h \cdot U'(s^{hh})} &= \lambda + \mu \left[1 - \frac{p^l \cdot q^l}{p^h \cdot q^h}\right] > \lambda + \mu \left[1 - \frac{p^l \cdot (1 - q^l)}{p^h \cdot (1 - q^h)}\right]\\ &= \frac{\beta^{hl}}{p^h \cdot (1 - q^h) U'(s^{hl})}.\end{aligned} \tag{8}$$

It is clear that $w^h = \max\{s^{hh}, s^{hl}\}$. To show that $s^{hh} \geq s^{hl}$, suppose that the opposite were true. Then, $s^{hh} < s^{hl} = w^h \Rightarrow \beta^{hh} = 0$ (by complementary slackness), which in turn would imply $\beta^{hl} = p^h$ (from (2)). But from (8), $\beta^{hh} = 0 \Rightarrow \beta^{hl} < 0$, which cannot be the case. We must therefore have $w^h = s^{hh} \geq s^{hl}$. Similarly, we can use (3), (6), and (7) to show that $w^l = s^{lh} \geq s^{ll}$.

To complete the first part of the proof, we now establish that $w^h = s^{hh} = s^{hl}$. Again, suppose not, i.e., $w^h = s^{hh} > s^{hl}$. But this implies that $\beta^{hl} = 0$ and in turn (from (5) and (7)) that:

$$\begin{aligned}0 = \frac{\beta^{hl}}{p^h \cdot (1 - q^h) U'(s^{hl})} &= \lambda + \mu \left[1 - \frac{p^l \cdot (1 - q^l)}{p^h \cdot (1 - q^h)}\right]\\ &> \lambda + \mu \left[1 - \frac{(1 - p^l) \cdot (1 - q^l)}{(1 - p^h) \cdot (1 - q^h)}\right]\\ &= \frac{\beta^{ll}}{(1 - p^h) \cdot (1 - q^h) U'(s^{ll})}.\end{aligned}$$

However, that would imply $\beta^{ll} < 0$, which is impossible.

In light of these results, let $u^h \equiv U(w^h) = U(s^{hh}) = U(s^{hl})$ and $u^l \equiv U(w^l) = U(s^{lh})$. Also note that since $s^{ll} \le s^{lh}$ we can represent $U(s^{ll})$ equivalently as $(u^l - \delta)$, $\delta \ge 0$. This enables us to re-cast program $\mathbf{P}_1$ as follows:

$$\min_{w^h, w^l, \delta} \; [p^h \cdot w^h + (1 - p^h) \cdot w^l]$$

subject to:

$$p^h \cdot u^h + (1 - p^h) \cdot q^h \cdot u^l + (1 - p^h) \cdot (1 - q^h)[u^l - \delta] - e(a^h) \ge \overline{U} \tag{9}$$

$$\begin{aligned} &p^h \cdot u^h + (1 - p^h) \cdot q^h \cdot u^l + (1 - p^h) \cdot (1 - q^h) \cdot [u^l - \delta] - e(a^h) \\ &\quad \ge p^l \cdot u^h + (1 - p^l) \cdot q^l \cdot u^l + (1 - p^l) \cdot (1 - q^l) \cdot [u^l - \delta] - e(a^l). \end{aligned} \tag{10}$$

When both (9) and (10) are satisfied as equalities, it must be the case that:

$$\begin{aligned} u^h = \overline{U} &+ \frac{e(a^h) \cdot (1 - p^l) - e(a^l) \cdot (1 - p^h)}{(p^h - p^l)} \\ &- \delta \cdot \frac{(1 - p^h) \cdot (1 - p^l) \cdot (q^h - q^l)}{(p^h - p^l)}; \end{aligned} \tag{11}$$

$$\begin{aligned} u^l = \overline{U} &- \frac{e(a^h) \cdot p^l - e(a^l) \cdot p^h}{(p^h - p^l)} \\ &+ \delta \cdot \frac{p^h \cdot (1 - p^l) \cdot (1 - q^l) - p^l \cdot (1 - p^h) \cdot (1 - q^h)}{(p^h - p^l)}. \end{aligned} \tag{12}$$

The above program can thus be reduced to the following unconstrained optimization:

$$Z(\delta) \equiv \min_{\delta \ge 0} p^h \cdot U^{-1}(u^h) + (1 - p^h) \cdot U^{-1}(u^l).$$

Differentiating, and recalling that $V(\cdot)$ represents the derivative of $U^{-1}(\cdot)$, we obtain:

$$\begin{aligned} \frac{d}{d\delta} Z(\delta) = &-p^h \cdot V(u^h) \cdot \left[\frac{(1 - p^h) \cdot (1 - p^l) \cdot (q^h - q^l)}{(p^h - p^l)}\right] + (1 - p^h) \\ &\cdot V(u^l) \cdot \left[\frac{p^h \cdot (1 - p^l) \cdot (1 - q^l) - p^l \cdot (1 - p^h) \cdot (1 - q^h)}{(p^h - p^l)}\right]; \end{aligned} \tag{13}$$

$$\begin{aligned} \frac{d^2}{d\delta^2} Z(\delta) = &\; p^h \cdot V'(u^h) \cdot \left[\frac{(1 - p^h) \cdot (1 - p^l) \cdot (q^h - q^l)}{(p^h - p^l)}\right]^2 + (1 - p^h) \\ &\cdot V'(u^l) \cdot \left[\frac{p^h \cdot (1 - p^l)(1 - q^l) - p^l \cdot (1 - p^h)(1 - q^h)}{(p^h - p^l)}\right]^2 > 0. \end{aligned}$$

Therefore, a necessary and sufficient condition for subjective information to have value (that is, for the optimal δ to be positive) is that $\frac{d}{d\delta} Z(\delta)|_{\delta=0} < 0$, i.e., the right-hand side of (13) is less than zero at $\delta = 0$. This requires:

$$\frac{p^h \cdot (1 - p^l) \cdot (1 - q^l) - p^l \cdot (1 - p^h) \cdot (1 - q^h)}{p^h \cdot (1 - p^l) \cdot (q^h - q^l)} < \frac{V\left(\overline{U} + \dfrac{e(a^h) \cdot (1 - p^l) - e(a^l) \cdot (1 - p^h)}{(p^h - p^l)}\right)}{V\left(\overline{U} - \dfrac{e(a^h) \cdot p^l - e(a^l) \cdot p^h}{(p^h - p^l)}\right)}.$$

Dividing through both parts of the left-hand side by $p^h \cdot (1 - p^l) \cdot (1 - q^h)$ and using the notation for P and Q introduced in the text, we then obtain the desired inequality (1).

Proof of Proposition 2

To solve program $\mathbf{P}_2$, we again let λ denote the multiplier for constraint (i) and μ denote the (positive) multiplier for constraint (ii). Let β^{jk} be the multiplier for the restriction $w^j - s^{jk} \geq 0$. We then have the following first-order conditions for w^j and s^{jk}:

$$-p^j(a^h) + \sum_{k=1}^{n} \beta^{jk} = 0. \tag{14}$$

$$\frac{\beta^{jk}}{U'(s^{jk}) \cdot p^j(a^h) \cdot q^k(a^h)} = \lambda + \mu \left[1 - \frac{p^j(a^l)}{p^j(a^h)} \cdot \frac{q^k(a^l)}{q^k(a^h)}\right]. \tag{15}$$

To show first that $s^{j,k+1} \geq s^{j,k}$, suppose not, i.e., $s^{j,k+1} < s^{j,k} \leq w^j$. By complementary slackness, it would follow that $\beta^{j,k+1} = 0$. Using (15) and MLRP, we would then obtain:

$$\begin{aligned} 0 = \frac{\beta^{j,k+1}}{U'(s^{j,k+1}) \cdot p^j(a^h) \cdot q^{k+1}(a^h)} &= \lambda + \mu \left[1 - \frac{p^j(a^l)}{p^j(a^h)} + \frac{q^{k+1}(a^l)}{q^{k+1}(a^h)}\right] \\ > \lambda + \mu \left[1 - \frac{p^j(a^l)}{p^j(a^h)} + \frac{q^k(a^l)}{q^k(a^h)}\right] &= \frac{\beta^{jk}}{U'(s^{jk}) \cdot p^j(a^h) \cdot q^k(a^h)}. \end{aligned}$$

However that is impossible since $\beta^{jk} \geq 0$.

We next show that for all realizations $x^j > x^1$, the subjective measure is ignored. Again, suppose not, i.e., there is some $x^j > x^1$ such that, for some k, $s^{jk} < w^j$. As a consequence, $\beta^{jk} = 0$, which, again from MLRP and (15), would imply:

$$\begin{aligned} 0 = \lambda + \mu \left[1 - \frac{p^j(a^l)}{p^j(a^h)} \cdot \frac{q^k(a^l)}{q^k(a^h)}\right] &> \lambda + \mu \left[1 - \frac{p^{j-1}(a^l)}{p^{j-1}(a^h)} \cdot \frac{q^k(a^l)}{q^k(a^h)}\right] \\ = \frac{\beta^{j-1,k}}{U'(s^{j-1,k}) \cdot p^{j-1}(a^h) \cdot q^k(a^h)}, \end{aligned}$$

contradicting that β^{jk} must be non-negative.

Finally, we show that when $x = x^1$, the subjective metric is used only if $y = y^1$. Suppose to the contrary that there exists $y^k > y^1$ such that $s^{1k} < w^1$. This implies that $\beta^{1k} = 0$, or:

$$0 = \frac{\beta^{1k}}{U'(s^{1k}) \cdot p^1(a^h) \cdot q^k(a^h)} = \lambda + \mu \left[1 - \frac{p^1(a^l)}{p^1(a^h)} \cdot \frac{q^k(a^l)}{q^k(a^h)}\right]$$

$$> \left[1 - \frac{p^1(a^l)}{p^1(a^h)} \cdot \frac{q^{k-1}(a^l)}{q^{k-1}(a^h)}\right] = \frac{\beta^{1,k-1}}{U'(s^{1,k-1})p^1(a^h) \cdot q^{k-1}(a^h)},$$

resulting again in a contradiction to the requirement that $\beta^{1,k-1} \geq 0$. We have thus proved that subjective metrics are used only when $x = x^1$ *and* $y = y^1$.

Proof of Proposition 3

Consider program $\mathbf{P}_3$. We use λ_i and μ_i to represent the multipliers for agent i's individual rationality and IC constraint, respectively, and γ^{jkuv} as the multiplier for the bonus pool constraint when the realized outcome is $(x_1^j, y_1^k, x_2^u, y_2^v)$.

The first-order condition for $s_1(\cdot)$ is then given by:

$$\frac{\gamma^{jkuv}}{p_1^j(a_1^h) \cdot q_1^k(a_1^h) \cdot p_2^u(a_2^h) \cdot q_2^v(a_2^h)} \cdot \frac{1}{U_1'(s_1(\cdot))} = \lambda_1 + \mu_1 \left[1 - \frac{p_1^j(a_1^l)}{p_1^j(a_1^h)} \cdot \frac{q_1^k(a_1^l)}{q_1^k(a_1^h)}\right]. \tag{16}$$

Similarly, the first-order condition for $s_2(\cdot)$ is:

$$\frac{\gamma^{jkuv}}{p_1^j(a_1^h) \cdot (q_1^k(a_1^h) \cdot p_2^u(a_2^h) \cdot q_2^v(a_2^h)} \cdot \frac{1}{U_2'(s_2(\cdot))} = \lambda_2 + \mu_2 \left[1 - \frac{p_2^u(a_2^l)}{p_2^u(a_2^h)} + \frac{q_2^v(a_2^l)}{q_2^v(a_2^h)}\right]. \tag{17}$$

To show that proper bonus pools are optimal for all verifiable outcomes, suppose not, i.e., assume there is some realization $(x_1^{\hat{j}}, y_1^{\hat{k}}, x_2^{\hat{u}}, y_2^{\hat{v}})$ for which $s_1(\cdot) + s_2(\cdot) < w^{\hat{j}\hat{u}}$. This implies that $\gamma^{\hat{j}\hat{k}\hat{u}\hat{v}} = 0$ or, using (16), that:

$$\lambda_1 + \mu_1 \left[1 - \frac{p_1^{\hat{j}}(a_1^l)}{p_1^{\hat{j}}(a_1^h)} \cdot \frac{q_1^{\hat{k}}(a_1^l)}{q_1^{\hat{k}}(a_1^h)}\right] = 0. \tag{18}$$

But (18) is independent of $\hat{u}$ and $\hat{v}$, so this must hold for all realizations of (x_2^u, y_2^v), implying in turn (from (16)) that:

$$\gamma^{\hat{j}\hat{k}uv} = 0 \text{ for all } u, v. \tag{19}$$

Similarly, using the right-hand side of (17), $\gamma^{\hat{j}\hat{k}\hat{u}\hat{v}} = 0$ implies that:

$$\lambda_2 + \mu_2 \left[1 - \frac{p_2^{\hat{u}}(a_2^l)}{p_2^{\hat{u}}(a_2^h)} \cdot \frac{q_2^{\hat{v}}(a_2^l)}{q_2^{\hat{v}}(a_2^h)}\right] = 0.$$

This equation is independent of $\hat{j}$ and $\hat{k}$, and so it must hold for all realizations of (x_1^j, y_1^k), implying (from (17)) that:

$$\gamma^{jk\hat{u}\hat{v}} = 0 \text{ for all } j, k. \tag{20}$$

Repeating the preceding arguments yields:

$$\gamma^{\hat{j}k\hat{u}v} = 0 \text{ for all } k, v. \tag{21}$$

Finally, the first-order condition for the bonus pool amount $w^{\hat{j}\hat{u}}$ is:

$$p_1^{\hat{j}}(a_1^h) \cdot p_2^{\hat{u}}(a_2^h) = \sum_k \sum_v \gamma^{\hat{j}k\hat{u}v}. \tag{22}$$

Clearly, (22) cannot hold if (21) holds and therefore we have established that proper bonus pools are optimal for all objective outcome realizations.

Proof of Proposition 4

(i) From Proposition 3, we know that proper bonus pools are optimal. We can thus recast program $\mathbf{P}_3$ by dropping constraint (iii) and letting $s_2(x_1^j, y_1^k, x_2^u, y_2^v) = w^{ju} - s_1(x_1^j, y_1^k, x_2^u, y_2^v)$ throughout. Using the same notation for multipliers as in the previous proof, we obtain the following first-order condition for $s_1(\cdot)$:

$$\frac{U_1'(s_1(\cdot))}{U_2'(w^{ju} - s_1(\cdot))} = \frac{\lambda_2 + \mu_2\left[1 - \dfrac{p_2^u(a_2^l)}{p_2^u(a_2^h)} \cdot \dfrac{q_2^v(a_2^l)}{q_2^v(a_2^h)}\right]}{\lambda_1 + \mu_1\left[1 - \dfrac{p_1^j(a_1^l)}{p_1^j(a_1^h)} \cdot \dfrac{q_1^k(a_1^l)}{q_1^k(a_1^h)}\right]}. \tag{23}$$

The first-order condition for w^{ju} can similarly be simplified to:

$$\sum_k \sum_v U_2'(w^{ju} - s_1(\cdot)) \cdot \left[\lambda_2 + \mu_2\left[1 - \frac{p_2^u(a_2^l)}{p_2^u(a_2^h)} \cdot \frac{q_2^v(a_2^l)}{q_2^v(a_2^h)}\right]\right] \cdot q_1^k(a_1^h) \cdot q_2^v(a_2^h) = 1. \tag{24}$$

To show that w^{ju} is monotone increasing in j, consider an arbitrary u and arbitrary $\hat{j} > \tilde{j}$. Note that the left-hand side of (24) is independent of x_1^j, other than the $U_2'(\cdot)$ term. Therefore, it cannot be the case that:

$$w^{\hat{j}u} - s_1(x_1^{\hat{j}}, y_1^k, x_2^u, y_2^v) < w^{\tilde{j}u} - s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v)$$

for all k and v, since (24) would then be violated for either $w^{\hat{j}u}$ or $w^{\tilde{j}u}$. So, there must exist some $\{y_1^k, y_2^v\}$ such that:

$$w^{\hat{j}u} - s_1(x_1^{\hat{j}}, y_1^k, x_2^u, y_2^v) \geq w^{\tilde{j}u} - s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v): \tag{25}$$

But $\hat{j} > \tilde{j}$ and MLRP together imply, from (23), that:

$$\frac{U_1'(s_1(x_1^{\hat{j}}, y_1^k, x_2^u, y_2^v))}{U_2'(w^{\hat{j}u} - s_1(x_1^{\hat{j}}, y_1^k, x_2^u, y_2^v))} < \frac{U_1'(s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v))}{U_2'(w^{\tilde{j}u} - s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v))}. \tag{26}$$

In light of (25), this can hold only if:

$$U_1'(s_1(x_1^{\hat{j}}, y_1^k, x_2^u, y_2^v)) < U_1'(s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v)), \text{ or}$$
$$s_1(x_1^{\hat{j}}, y_1^k, x_2^u, y_2^v) > s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v)). \tag{27}$$

Summing the inequalities in (25) and (27) yields: $w^{\hat{j}u} > w^{\tilde{j}u}$, which is the desired result.

To show that w^{ju} is monotone increasing in u, (23) can be substituted into (24) to yield:

$$\sum_k \sum_v U_1'(s_1(\cdot)) \cdot \left[\lambda_1 + \mu_1 \left[1 - \frac{p_1^j(a_1^l)}{p_1^j(a_1^h)} \cdot \frac{q_1^k(a_1^l)}{q_1^k(a_1^h)}\right]\right] \cdot q_1^k(a_1^h) \cdot q_2^v(a_2^h) = 1. \tag{28}$$

Other than the $U_1'(\cdot)$ term, the above expression is independent of x_2^u. So, consider an arbitrary j, and arbitrary $\hat{u} > \tilde{u}$. Then, in order for (28) to be met for both $w^{j\hat{u}}$ and $w^{j\tilde{u}}$, there must exist some (y_1^k, y_2^v) such that:

$$s_1(x_1^j, y_1^k, x_2^{\hat{u}}, y_2^v) \geq s_1(x_1^j, y_1^k, x_2^{\tilde{u}}, y_2^v). \tag{29}$$

But from (23), $\hat{u} > \tilde{u}$ and MLRP imply that:

$$\frac{U_1'(s_1(x_1^j, y_1^k, x_2^{\hat{u}}, y_2^v))}{U_2'(w^{j\hat{u}} - s_1(x_1^j, y_1^k, x_2^{\hat{u}}, y_2^v))} > \frac{U_1'(s_1(x_1^j, y_1^k, x_2^{\tilde{u}}, y_2^v))}{U_2'(w^{j\hat{u}} - s_1(x_1^j, y_1^k, x_2^{\tilde{u}}, y_2^v))}.$$

Given (29), this inequality can hold only if:

$$U_2'(w^{j\hat{u}} - s_1(x_1^j, y_1^k, x_2^{\hat{u}}, y_2^v)) < U_2'(w^{j\tilde{u}} - s_1(x_1^j, y_1^k, x_2^{\tilde{u}}, y_2^v)), \text{ i.e.,}$$
$$w^{j\hat{u}} - s_1(x_1^j, y_1^k, x_2^{\hat{u}}, y_2^v) > w^{j\tilde{u}} - s_1(x_1^j, y_1^k, x_2^{\tilde{u}}, y_2^v). \tag{30}$$

Adding (29) and (30) then yields $w^{j\tilde{u}} > w^{j\hat{u}}$, completing the proof that the bonus pool is monotone increasing in objective indicators.

(ii) To examine pay as a function of the subjective metrics, consider (23). For any given (x_1^j, x_2^u), the left-hand side of (23) is strictly decreasing in $s_1(\cdot)$. From MLRP, the right-hand side of (23) (strictly) decreases in y_1^k and increases in y_2^v, implying that $s_1(\cdot)$ increases in y_1^k, while $(w^{ju} - s_1(\cdot))$ increases in y_2^v. Each manager's compensation thus increases in his own subjective metric.

Manager 1's payoff is increasing in his objective metric because for arbitrary k, u, v, and $\hat{j} > \tilde{j}$ we have:

$$\frac{U_1'(s_1(x_1^{\hat{j}}, y_1^k, x_2^u, y_2^v))}{U_2'(w^{\hat{j}u} - s_1(x_1^{\hat{j}}, y_1^k, x_2^u, y_2^v))} < \frac{U_1'(s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v))}{U_2'(w^{\hat{j}u} - s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v))}$$
$$< \frac{U_1'(s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v))}{U_2'(w^{\tilde{j}u} - s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v))}.$$

Here, the first inequality follows from MLRP and $\hat{j} > \tilde{j}$, using (23), and the second inequality from $w^{\hat{j}u} > w^{\tilde{j}u}$. Comparing the first and last expressions immediately yields:

$$s_1(x_1^{\hat{j}}, y_1^k, x_2^u, y_2^v) > s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v).$$

A parallel argument yields the same result for agent 2.

(iii) Follows directly from the use of a proper bonus pool (see the proof for (ii)).

(iv) We shall first show that agent 2's compensation cannot be a monotone function of agent 1's objective outcome. Suppose that for every realization of (y_1^k, x_2^u, y_2^v), agent 2's compensation is increasing in agent 1's objective outcome. Then, for $1 \leq \tilde{j} < \hat{j} \leq n$:

$$w^{\hat{j}u} - s_1(x_1^{\hat{j}}, y_1^k, x_2^u, y_2^v) > w^{\tilde{j}u} - s_1(x_1^{\tilde{j}}, y_1^k, x_2^u, y_2^v)$$

for all (y_1^k, x_2^u, y_2^v). But if this holds, then it is clear by inspection that Equation (24) cannot be satisfied for both $w^{\hat{j}u}$ and $w^{\tilde{j}u}$. The same reasoning shows that agent 2's compensation cannot decrease monotonically in agent 1's objective outcome. A symmetric argument using Equation (28) shows that agent 1's compensation cannot be monotone in agent 2's objective outcome.

Proof of Proposition 5

Suppose that the principal wants to implement the high action a_i^h as a dominant strategy. Then, solving the appropriate modification of $\mathbf{P}_3$, the first-order conditions for the bonus pool and compensations can be derived as below:

$$p_1^j(a_1^h) \cdot p_2^u(a_2^h) = \sum_k \sum_v \gamma^{jkuv}; \tag{31}$$

$$\frac{\gamma^{jkuv}}{p_1^j(\cdot)q_1^k(\cdot)p_2^u(\cdot)q_2^v(\cdot)} \cdot \frac{1}{U_1'(s_1(\cdot))} = \lambda_1 + \left[\mu_1 + \alpha_1 \cdot \frac{p_2^u(a_2^l)}{p_2^u(a_2^h)} \cdot \frac{q_2^v(a_2^l)}{q_2^v(a_2^h)}\right] \cdot \left[1 - \frac{p_1^j(a_1^l)}{p_1^j(a_1^h)} \cdot \frac{q_1^k(a_1^l)}{q_1^k(a_1^h)}\right]; \tag{32}$$

$$\frac{\gamma^{jkuv}}{p_1^j(\cdot)q_1^k(\cdot)p_2^u(\cdot)q_2^v(\cdot)} \cdot \frac{1}{U_2'(s_2(\cdot))} = \lambda_2 + \left[\mu_2 + \alpha_2 \cdot \frac{p_1^j(a_1^l)}{p_1^j(a_1^h)} \cdot \frac{q_1^k(a_1^l)}{q_1^k(a_1^h)}\right] \cdot \left[1 - \frac{p_2^u(a_2^l)}{p_2^u(a_2^h)} \cdot \frac{q_2^v(a_2^l)}{q_2^v(a_2^h)}\right]. \tag{33}$$

Now, suppose that there is some vector $(j, k, u, v) \neq (1, 1, 1, 1)$ for which the bonus pool is not paid out in full. With no loss of generality, assume that vector component $j > 1$. By complementary slackness, this indicates that $\gamma^{jkuv} = 0$, and therefore that the right-hand side of both (32) and (33) equal zero. But, for a nontrivial incentive problem, it must be the case that $\alpha_i + \mu_i > 0$. From MLRP, the right-hand side of (32) strictly increases in j and k, and the right-hand side of (33) strictly increases in u and v. In turn, this implies that $\gamma^{\hat{j}kuv} < 0$, where $\hat{j} = j - 1$, which is impossible. We thus have a contradiction.

Proof of Proposition 6

If the bonus pool is not fully paid out for the lowest state, then the corresponding multiplier $\gamma^{1111} = 0$. From (32) and (33), we obtain:

$$\lambda_1 = -\left[\mu_1 + \alpha_1 \cdot \frac{p_2^1(a_2^l)}{p_2^1(a_2^h)} \cdot \frac{q_2^1(a_2^l)}{q_2^1(a_2^h)}\right] \cdot \left[1 - \frac{p_1^1(a_1^l)}{p_1^1(a_1^h)} \cdot \frac{q_1^1(a_1^l)}{q_1^1(a_1^h)}\right]; \tag{34}$$

$$\lambda_2 = -\left[\mu_2 + \alpha_2 \cdot \frac{p_1^1(a_1^l)}{p_1^1(a_1^h)} \cdot \frac{q_1^1(a_1^l)}{q_1^1(a_1^h)}\right] \cdot \left[1 - \frac{p_2^1(a_2^l)}{p_2^1(a_2^h)} \cdot \frac{q_2^1(a_2^l)}{q_2^1(a_2^h)}\right]. \tag{35}$$

From Proposition 5, we know that the bonus pool is fully paid out for all other realizations, i.e., $\forall (j, k, u, v) \neq (1, 1, 1, 1)$, $s_2(x_1^j, y_1^k, x_2^u, y_2^v) = w^{ju} - s_1(x_1^j, y_1^k, x_2^u, y_2^v)$. Therefore, dividing (33) by (32) and using Equations (34)–(35), we obtain $\forall (j, k, u, v) \neq (1, 1, 1, 1)$:

$$\frac{U_1'(s_1(x_1^j, y_1^k, x_2^u, y_2^v))}{U_2'(w^{ju} - s_1(x_1^j, y_1^k, x_2^u, y_2^v))} = \frac{A + B}{C + D},$$

where:

$$A \equiv -\left[\mu_2 + \alpha_2 \cdot \frac{p_1^1(a_1^l)}{p_1^1(a_1^h)} \cdot \frac{q_1^1(a_1^l)}{q_1^1(a_1^h)}\right] \cdot \left[1 - \frac{p_2^1(a_2^l)}{p_2^1(a_2^h)} \cdot \frac{q_2^1(a_2^l)}{q_2^1(a_2^h)}\right]$$

$$B \equiv \left[\mu_2 + \alpha_2 \cdot \frac{p_1^j(a_1^l)}{p_1^j(a_1^h)} \cdot \frac{q_1^k(a_1^l)}{q_1^k(a_1^h)}\right] \cdot \left[1 - \frac{p_2^u(a_2^l)}{p_2^u(a_2^h)} \cdot \frac{q_2^v(a_2^l)}{q_2^v(a_2^h)}\right]$$

$$C \equiv -\left[\mu_1 + \alpha_1 \cdot \frac{p_2^1(a_2^l)}{p_2^1(a_2^h)} \cdot \frac{q_2^1(a_2^l)}{q_2^1(a_2^h)}\right] \cdot \left[1 - \frac{p_1^1(a_1^l)}{p_1^1(a_1^h)} \cdot \frac{q_1^1(a_1^l)}{q_1^1(a_1^h)}\right]$$

$$D \equiv \left[\mu_1 + \alpha_1 \cdot \frac{p_2^u(a_2^l)}{p_2^u(a_2^h)} \cdot \frac{q_2^v(a_2^l)}{q_2^v(a_2^h)}\right] \cdot \left[1 - \frac{p_1^j(a_1^l)}{p_1^j(a_1^h)} \cdot \frac{q_1^k(a_1^l)}{q_1^k(a_1^h)}\right]$$

So for $j = 1$, $k = 1$, $(u, v) \neq (1, 1)$, we have, after simplifying this expression:

$$\frac{U_1'(s_1(x_1^1, y_1^1, x_2^u, y_2^v))}{U_2'(w^{1u} - s_1(x_1^1, y_1^1, x_2^u, y_2^v))} = \frac{-\left[\mu_2 + \alpha_2 \cdot \frac{p_1^1(a_1^l)}{p_1^1(a_1^h)} \cdot \frac{q_1^1(a_1^l)}{q_1^1(a_1^h)}\right]}{\alpha_1 \cdot \left[1 - \frac{p_2^1(a_2^l)}{p_2^1(a_2^h)} \cdot \frac{q_2^1(a_2^l)}{q_2^1(a_2^h)}\right]}. \tag{36}$$

Note that the right-hand side of (36) is independent of u and v. Hence, $\forall u > 1$, $s_1(x_1^1, y_1^1, x_2^u, y_2^v)$ is constant in v, and for $u = 1$, $s_1(x_1^1, y_1^1, x_2^1, y_2^v)$ is constant in v, $\forall v \geq 2$.

Similarly, for $u = 1$, $v = 1$, $(j, k) \neq (1, 1)$:

$$\frac{U_1(s_1(x_1^j, y_1^k, x_2^1, y_2^1))}{U_2(w^{j1} - s_1(x_1^j, y_1^k, x_2^1, y_2^1))} = \frac{-\alpha_2 \cdot \left[1 - \frac{p_2^1(a_2^l)}{p_2^1(a_2^h)} \cdot \frac{q_2^1(a_2^l)}{q_2^1(a_2^h)}\right]}{\left[\mu_1 + \alpha_1 \cdot \frac{p_2^1(a_2^l)}{p_2^1(a_2^h)} \cdot \frac{q_2^1(a_2^l)}{q_2^1(a_2^h)}\right]}. \tag{37}$$

This implies that $\forall j > 1$, $s_1(x_1^j, y_1^k, x_2^1, y_2^1)$ is constant in k, and for $j = 1$, $s_1(x_1^1, y_1^k, x_2^1, y_2^1)$ is constant in k $\forall k \geq 2$.

We have thus demonstrated that rather than employ n^4 distinct payoffs for each manager, the optimal bonus pool leads to the following compression:

- For $(j, k, u, v) = (1, 1, 1, v)$, $2 \le v \le n$, s are identical $\Rightarrow$ deduct $(n - 2)$;
- For $(j, k, u, v) = (1, 1, u, v)$, $u > 1$, s is constant in $v \Rightarrow$ deduct $(n - 1)^2$;
- For $(j, k, u, v) = (1, k, 1, 1,)$, $k > 1$, s is constant in $k \Rightarrow$ deduct $(n - 2)$;
- For $(j, k, u, v) = (j, k, 1, 1)$, $j > 1$, s is constant in $k \Rightarrow$ deduct $(n - 1)^2$.

The maximum number of distinct payoffs is therefore given by:

$$n^4 - 2(n - 2) - 2(n - 1)^2 = n^4 - 2n^2 + 2n + 2.$$

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The Information Content of Business Combination Disclosure Level

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ABSTRACT: This study explores causes and effects of business combinations disclosure level. Investigating the association between disclosure level on business combination and acquirers' future performance, I find that acquirers' future performance as measured by the change in ROA and by abnormal stock returns increases with abnormal levels of disclosure on business combinations. Investigating the determinants of business combination disclosure, I find that the disclosure level on business combinations decreases with abnormal levels of the purchase price allocated to goodwill. Both results provide evidence consistent with disclosure theory and suggest that acquirers tend to provide less forthcoming disclosure on less favorable acquisitions ("bad news"). I also provide evidence consistent with investors failing to immediately incorporate the information content of business combination disclosure level into their information set and evidence that investors are quicker to react to firms with negative abnormal disclosure.

Keywords: *business combinations; disclosure; goodwill; performance.*

Data Availability: *Data are available from sources identified in the paper.*

I. INTRODUCTION

Business combinations are frequently of high economic significance to acquirers and can substantially impact their operations. Disclosure on such transactions is therefore potentially crucial for evaluating effects on acquirers' future earnings and cash flows. With this in mind, the FASB requires acquirers to provide comprehensive and detailed information on business combinations so that investors can evaluate the causes and effects of the acquisitions.

Disclosure theory (Verrecchia 1983; Dye 1985) suggests that, in equilibrium, managers tend to reveal good news (news that is expected to positively affect stock price) and withhold bad news. Managers behaving consistently with this reasoning are likely to provide more comprehensive information on an acquisition they expect to create added value (good news) and less information on an acquisition about which they are less confident (bad news). Using a unique sample of business combinations that were consummated from July 1, 2001

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to December 31, 2004, I investigate the factors that affect disclosure as well as the association between disclosure level and future performance to provide evidence suggesting that acquirers tend to withhold less favorable information (bad news) on business combinations.

Analysis suggests that the disclosure level on business combinations decreases with abnormal portions of the purchase price allocated to goodwill (defined as the residuals from a regression of the ratio of goodwill to the purchase price on acquirers' line of business targets' line of business, and acquirers' long-term growth expectations). Goodwill is measured in the purchase price allocation as a plug number, equal to the purchase price minus the net fair value of all identified assets acquired; thus, it mechanically subsumes any overpayment that may have transpired. Furthermore, goodwill is not subject to amortization, so increasing the portion allocated to goodwill and reducing the portion allocated to net identified assets (either through understating assets or overstating liabilities) enables acquirers to present higher post-acquisition earnings per share. Consequently, *ceteris paribus*, positive abnormal portions of the purchase price allocated to goodwill could, on average, be associated with (1) overpayment and/or (2) overstatement of goodwill in the allocation to avoid amortization expense, both of which could be considered bad news for investors.

Consistent with evidence in Lobo and Zhou (2001), this study shows that the disclosure level on business combinations decreases with the frequency of unexpected accruals and with the frequency of exactly meeting quarterly analysts' forecasts in the five years leading to the business combination. These two measures are associated in the accounting literature with earnings management.

Analyzing the association between disclosure level on business combinations and acquirers' future performance, I find that acquirers that display more forthcoming business combination disclosure exhibit a more positive change in ROA in the two years following the business combination. Stock returns also exhibit consistent association, increasing with abnormal disclosure levels on business combinations (where abnormal disclosure is defined as disclosure level after controlling for the materiality of the business combination). These results provide an *ex post* support to the argument that differences in disclosure level are not coincidental.

To investigate whether investors incorporate the differences in disclosure level into their information set, I test the association between disclosure level on business combinations and stock returns in the three days following the 10-K filing. I find that differences in disclosure level do not explain differences in stock returns around the disclosure date. I also find that it takes investors longer to react to high abnormal disclosure acquisitions than to low abnormal disclosure acquisitions. Even though I cannot rule out the possibility that there are more timely sources of information than the 10-K (e.g., 8-K filings, financial reports of the target when it is public), and thus that the 10-K provides no new information, results are robust to the exclusion of observations in which there are likely to be more timely sources of information than the 10-K. This result suggests that investors do not fully understand the value of the level of information disclosed and therefore do not price it accordingly. Dye (1985, 1986) suggests that it would be optimal for managers to withhold information when they are believed by investors to be endowed with complex information (proprietary and nonproprietary). Since disclosure requirements on business combinations are extensive, it is possible that investors interpret the differences in disclosure level on business combinations as resulting from the proprietary information and therefore do not "punish" the acquirer for less than full disclosure. But although Dye's (1986) theory predicts smaller reaction of the stock price to differences in disclosure level than otherwise, it cannot fully explain evidence of no reaction.

Finally, this study provides evidence that the purchase price relative to acquirers' pre-acquisition total assets is the main metric acquirers use to evaluate materiality constraints, whereas the purchase price relative to acquirers' market value and relative to acquirers' earnings, and the purchase price itself, play a lesser to no role in disclosure decisions.

This study contributes to the existing body of research in the following ways: First, it suggests that acquirers withhold from investors valuable information on business combinations and that investors do not fully incorporate the differences in disclosure level into their information set. Second, it documents the association between disclosure level and the amounts allocated to goodwill over and above its expected economic value to shed light on the effects of the unique accounting of goodwill on managerial incentives in M&A disclosure. Third, it provides evidence on materiality metrics that acquirers use for business combinations. It also adds to the evidence of cross-sectional inconsistency in employment of materiality judgment presented in Liu and Mittelstaedt (2002) by providing evidence of internal inconsistencies within a firm in classifying a single transaction as material.

The remainder of this paper is organized as follows: Section II provides background on disclosure requirements under SFAS No. 141. Section III outlines the research questions and the empirical predictions. Section IV describes the data used in this study. Section V provides descriptive statistics and details the empirical tests and the results, and Section VI offers my conclusions.

II. DISCLOSURE UNDER SFAS NO. 141

Disclosure Requirements

Mergers and acquisitions are among the largest items in firms' investment activities. Harford and Li (2005) report that between 1993 and 2000, there were 622 acquisitions with a purchase price greater than 10 percent of the acquirer's total assets compared to 450 firm-years with total capital expenditure greater than 10 percent of total assets.[1] The magnitude of business combinations makes disclosure on business combinations extremely important. Furthermore, the growing significance of intangible assets in the economy and as a portion of the assets acquired[2] further increases the importance of disclosure for investors' evaluation of the effects of business combinations on acquirers.

Recognizing the economic significance of business combinations to acquirers and their shareholders, the FASB provides in SFAS No. 141[3] the following statement on disclosure:

> Because acquisitions often result in a significant change to an entity's operation, the nature and the extent of the information disclosed about such transactions bear on users' ability to assess the effects of such changes on post-acquisition earnings and cash flow ... [therefore] the additional disclosures should be required to provide decision-useful information about the net assets acquired in the business combination.

In order to facilitate the above-mentioned objective, the FASB issued in SFAS No. 141 more comprehensive disclosure requirements on business combinations (paragraphs 51–58). For a material business combination, the disclosure requirements can be divided into five categories. (1) *General information about the business combination.* This is the only category that requires qualitative information. In this category management needs to explain why they believe the acquisition serves the firm's interests and makes economic sense. (2) *Information related to the allocation of the purchase price.* Under SFAS No. 141 acquirers have to allocate the purchase price to the assets acquired and to the liabilities assumed in the business combination. Paragraph 37 provides guidance on the methods of assigning values to the assets acquired and liabilities assumed. The guidance reflects the trend in the FASB of moving to fair value accounting. (3) *Information related to the nature and the amount of intangible assets that were recognized separate from goodwill.* (4) *Information related to the goodwill recognized.* (5) *Pro forma information.*

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[1] These data are found in the March 15, 2005 version. In later versions the authors do not discuss firms with large capital expenditure and, therefore, this part of the sample is taken out of the analysis.

[2] Nakamura (2003) finds that in 2000 U.S. firms invested at least $1 trillion in intangible assets, a level of investment that roughly equals the gross investment in corporate tangible assets. Intangible assets represent, on average, 84 percent of the purchase price in the sample used in this study.

[3] Appendix B, "Background information and basis for conclusions of SFAS No. 141," paragraphs B195–B196.

For business combinations that are material in aggregate but are not material individually, acquirers are required to disclose categories (3)–(5). Appendix A details the items for disclosure in each category.

Business Combinations' Disclosure Environment

The information that firms disclose on business combinations in the 10-K files is provided a few months after the actual acquisition deal sign-up. In some cases, firms announce the acquisitions but do not provide meaningful details (acquirers do tend to provide some reasoning in the announcement for a large acquisition). In a large acquisition of a privately held target (purchase price greater than 10 percent of the acquirer's total assets), the SEC requires disclosure of deal terms (in a Form 8-K).[4] Information about the purchase price allocation, which includes the breakdown of the purchase price to the assets acquired and liabilities assumed as well as information on intangible assets acquired and pro forma information, is provided only in the financial reports. In the 10-K, firms provide the most comprehensive information, as required by SFAS No. 141. For material acquisitions made early in the financial year, firms also provide preliminary SFAS No. 141 information on the 10-Q. Appendix B provides a timeline from the announcement of the acquisition to 250 trading days following the filing of the 10-K. The comprehensive information that acquirers should provide on business combinations under SFAS No. 141 requires disclosure of multiple items and may involve disclosure of proprietary information. Since the disclosure of each item is subject to the materiality constraint, the magnitude of disclosure is left to managerial discretion. This also complicates the evaluation of the completeness of disclosure. The time lag between the announcement of the acquisition and the disclosure on the 10-K, the extent and complexity of information required to be disclosed under SFAS No. 141, and the fact that some information on large acquisitions already exists can all lead managers to believe that, in this disclosure environment, investors may not penalize firms that disclose less than full information, either because investors believe that full information involves disclosure of proprietary information or because they fail to fully understand that information is being withheld.

III. RESEARCH QUESTIONS AND DEVELOPMENT OF EMPIRICAL PREDICTIONS

The original theoretical framework for voluntary disclosure, based on the work of Grossman and Hart (1980), Grossman (1981), and Milgrom (1981), concluded that when credible announcements of information are feasible, full disclosure is optimal. Verrecchia (1983) extends their model by assuming that there are additional costs for disclosure and suggesting that managers would behave optimally according to a threshold disclosure based on the expected effect of no disclosure on share value. This will lead them to withhold some "bad news." Dye (1985) suggests and Dye (1986) shows that when the signal managers receive is complex and involves both proprietary information (costly to disclose) and nonproprietary information (not costly to disclose), partial disclosure may be optimal and investors would expect less than full information.

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[4] See a review of the SEC disclosure requirements in Rodrigues and Stegemoller (2006).

Empirical literature provides evidence consistent with managers' disclosure decisions depending on the favorability of the information they are endowed with. This work suggests that managers tend to disclose good news but withhold or delay bad news. Givoly and Palmon (1982), Patell and Wolfson (1982), Chambers and Penman (1984), and Cohen et al. (2007) all suggest that managers tend to delay earnings announcements when earnings are lower than market expectations. Kothari et al. (2007) argue that managers have incentives to withhold bad news, since they bear high personal costs (loss of bonus, a decline in stock and options) when they disclose it. They conclude from the asymmetric reaction to bad and good news in their study that good news is disclosed earlier. Finally, Miller (2002) shows that firms tend to reduce the comprehensiveness of disclosure when a period of strong earnings is nearing its end and concludes that firms are more forthcoming when they have good news. Skinner (1994) suggests that litigation costs may drive managers in the opposite direction and motivate them to advance disclosure of bad news.

This study explores causes and effects of business combination disclosure level. It does so by investigating the factors that affect the level of disclosure on business combinations, and by investigating the association between disclosure level on business combinations and acquirers' performance. It further explores whether investors understand the value of the differences in disclosure level.

Factors Affecting Disclosure on Business Combinations

The FASB considers the most significant question in disclosure decisions: "Is this item large enough for users of the information to be influenced by it?"[5] In most cases the relative size of a judgment item, rather than its absolute size, determines whether the item is considered material. The FASB issued guidance with materiality thresholds for certain transactions[6]—but not for business combinations. When there is no specific guidance, the reporting entity has discretion with regard to the threshold. Usually in these cases the reporting entity and its auditors use rules of thumb.[7] This study considers four materiality metrics—the purchase price, and the purchase price relative to acquirers' market value, to acquirers' total assets, and to acquirers' net income—and investigates which of these explain disclosure level on business combinations. It further investigates whether materiality is employed uniformly on items within a single transaction.

Had acquirers considered only materiality in their disclosure decisions, a relatively large acquirer would have disclosed less information on a relatively small business combination than a relatively small acquirer would have disclosed on a relatively large business combination. The following examples of disclosure raise doubts as to whether the level of disclosure results exclusively from the employment of materiality constraints.

(1) **Tyco International:** Tyco did not report 700 acquisitions made between 1999 and 2001 with a total purchase price of $8 billion. Tyco is an extreme example of misusing the materiality constraint. Its actions were outside the accounting rules

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[5] SFAC No. 2, paragraph 123.

[6] Appendix C of SFAC No. 2 provides examples of transactions that have specific materiality thresholds.

[7] Examples of such rules of thumb are: (1) 5 percent of pretax income (a rule also specified in SEC Accounting Staff Bulletin No. 99), (2) 0.5 percent of total assets, (3) 1 percent of total equity, and (4) 0.5 percent of total revenue (Liu and Mittelstaedt 2002).

and thereby brought on lawsuits by investors for the inadequate disclosure on business combinations.

(2) **GE:** In 2004 GE made approximately 40 business combinations. Of the 40, 33 business combinations are not reported in the 10-K, and five are reported along with background information but with no disclosure of deal terms or financial information. Two acquisitions, Amersham PLC (purchase price of $11 billion in stock, or 3.6 percent of GE market value at the time of the acquisition) and Vivendi Universal (purchase price of $15.6 billion in stock and cash, or 5 percent of GE market value at the time of the acquisition), are reported in greater detail, which includes deal terms and the portions of the purchase price that were allocated to goodwill and intangible assets. GE does not disclose, however, a full purchase price allocation or factors contributing to a purchase price that resulted in goodwill. It should be noted that the purchase price of these two business combinations is greater than the median market capitalization of the S&P 500 firms at the time of the acquisition.

(3) **EDS/IBM:** This example compares two acquirers in the same industry. The smaller acquirer (EDS) discloses less information on a large target than the larger acquirer (IBM) discloses on a smaller target. In 2001 EDS spent $840 million in cash (3 percent of EDS market value at the time of the acquisition) to acquire Structural Dynamic Research Group, disclosed the name of the target and the purchase price, but provided no further information on the business combination. IBM spent $431 million in cash (0.3 percent of IBM market value at the time of the acquisition) to acquire Candle and disclosed almost complete information, as required by SFAS No. 141.

These examples suggest that factors other than the materiality constraint may affect disclosure on business combinations. Empirical work on disclosure identified several factors related to the firms' characteristics that may cause managerial disclosure decisions to divert from the naïve assessment of whether the item of disclosure is material. These are factors such as institutional ownership (Bushee and Noe 2000), inside ownership (Nagar et al. 2003), managers' stock-based incentives (Nagar et al. 2003; Eng and Mak 2003), and analysts' coverage (Lang and Lundholm 1996). All these factors transcend the disclosure on every transaction a firm undertakes.

In business combinations, the characteristics of the specific transaction, in particular excess amounts allocated to goodwill, could create additional incentives for managers to withhold information. The unique accounting and measurement for goodwill could suggest that managers will choose to disclose less when abnormal amounts of goodwill are recognized:

(1) Goodwill is measured as a plug number equal to the difference between the purchase price and the identified net assets. Therefore, goodwill mechanically subsumes any overpayment for the target.[8] Managerial incentives to overpay in M&A are documented in the literature. Harford and Li (2005) find that large grants of stocks and options to CEOs following mergers and acquisitions largely offset their wealth loss from poorly performing acquisitions. They argue that the expected

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[8] Henning et al. (2000) analyze the components of goodwill prior to SFAS No. 141 and find that on average 30.9 percent of goodwill is attributed to factors other than the going concern of the target and the synergy from combining the two entities. This portion of goodwill is mainly attributed to overpayment and overvaluation of the consideration.

additional grants leave managers, upon making an acquisition, virtually insensitive monetarily to a poor post-acquisition performance.[9]

(2) Goodwill is not subject to amortization and therefore does not reduce acquirers' post-acquisition earnings per share. Thus, increasing the portion allocated to goodwill and reducing the portion allocated to net identified assets (either through understating assets or overstating liabilities) allows acquirers to present higher post-acquisition earnings per share. The suggested investors' functional fixation on earnings (Hand 1990; Sloan 1996) may motivate managers to overstate the portion of the purchase price allocated to goodwill.[10]

Both overpayment and overstatement of goodwill in the purchase price allocation can be considered "bad news" by investors and may lead acquirers to withhold information from investors. Therefore, conditional on the economic factors that may result in goodwill (growth options, line of business), higher amounts allocated to goodwill could be representative of negative information about business combinations.

From the above discussion follows the hypothesis:

H1: Disclosure level on business combinations decreases with the abnormal portion of the purchase price allocated to goodwill.

Since lower disclosure level increases managers' flexibility to manage earnings in the future with less scrutiny by investors, firms exhibiting a greater tendency to manage earnings may be inclined to disclose less information on business combinations. The trade-off, of course, is that such behavior may be costly in the short term, since investors may realize the incomplete disclosure and penalize the stock price. In the longer term, managers will benefit from flexibility granted from lower disclosure level. Lobo and Zhou (2001) suggest that disclosure level decreases with the inclination to manage earnings. In this study I test whether these results hold for business combinations.

The Association between Disclosure Level and Future Performance

The next step is exploring the effect of business combination disclosure, i.e., investigating the association between disclosure level and acquirers' post-acquisition performance. If a lower level of disclosure suggests less favorable information (bad news), then I expect a positive association between the level of disclosure and firms' performance. Most theoretical models predict an immediate decline in the stock price following no disclosure, as investors assume that the information withheld is negative. This study investigates whether investors indeed incorporate the information contained in the level of disclosure on business combination in their information set and react immediately. However, regardless of whether investors are able to interpret the level of disclosure and react immediately, if a lower level of disclosure truly suggests less favorable information, then the level of disclosure should also explain a firm's future performance following the acquisition. Thus, *ceteris paribus*, acquirers with more forthcoming business combination disclosures are expected to outperform acquirers with more stringent business combination disclosures. Therefore my formal hypothesis is:

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[9] See also anecdotal evidence from the *New York Times* article by Andrew Ross Sorkin on April 7, 2002, describing the outcome for Chase's shareholders and CEO as a result of the J.P. Morgan acquisition (Sorkin 2002).

[10] See, for example, the testimony of Marla Sincavage, in a roundtable on M&A at the University of Rochester, held in November 2005. She indicated that the main concern of acquirers is the effect the business combination would have on their earnings per share. For the full discussion see University of Rochester (2005).

H2: Post-acquisition performance is increasing in the level of abnormal disclosure on business combination (disclosure level after controlling for materiality).

Reflection of the "Bad News" in Stock Prices

The last step in the analysis pertains to whether investors incorporate the value of differences in disclosure levels on business combinations into their information set. Analytical disclosure models employ different stylized assumptions regarding the cost of disclosure and the certainty that managers are endowed with information. All models except for Dye (1986) assume a single, easy-to-interpret type of information. Dye (1985, 1986) suggests that information could be complex (proprietary and nonproprietary), but he also assumes that investors would be able to interpret the information or lack thereof. Following this reasoning, short-window returns should reflect the information embedded in the level of disclosure on a business combination. Namely, if there is a statistically significant association between abnormal business combination disclosure level and acquirers' future performance, then this association should be reflected in stock prices around disclosure. Following is my formal hypothesis:

H3: Acquirers' abnormal stock returns around 10-K filing increase with the level of abnormal disclosure on business combinations.

IV. DATA

The data in the sample consist of business combinations made by the nonfinancial S&P 500 firms (two-digit SIC codes 60–69 were excluded) and consummated between July 1, 2001 (the effective date of SFAS No. 141) and December 31, 2004.

The data were hand-collected from the 10-K files in the SEC's EDGAR database. Acquisitions, in most cases, are disclosed in the second note of the annual reports. I use a keyword search for the words "Acquisitions" or "Business Combination" to find the "Acquisitions" note. To ensure completeness of the sample, I employ three additional search measures. First, I go over the titles of the notes to the annual reports to cover the possibility of a different title for the footnote. Second, I compare the sample to the list of "Completed Acquisitions" in the SDC (Thomson) database and use as a keyword the target's name to search in the 10-Ks for business combinations included in the SDC but missing from the sample. Third, I compare the reported amounts of cash outflow for acquisitions in the cash flow statement (Compustat #129) to the acquisitions recorded in my sample, to ensure there are no large discrepancies in the overall cash amounts spent on acquisitions. Appendix C lists all the data items that were hand-collected. Since some items listed in Appendix C are sometimes disclosed in parts of the 10-K other than the acquisition footnote,[11] I use a keyword search for certain data items in the complete annual reports. Other data used in this study are obtained from Compustat (annual), CRSP (daily), I/B/E/S, ExecuComp, and Thomson Financials (SDC, Inside Ownership, and Institutional Investors).

Table 1, Panel A, outlines the sample composition. In total, the sample includes 1,019 observations, which represent 297 acquiring firms. Of the total observations, 830 are of single business combinations, 117 of which are also included in the disclosure of aggregated business combinations (e.g., an acquirer discloses only the goodwill and intangible assets for a single business combination, but these amounts are included in a disclosure of the

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[11] Though SFAS No. 141 specifically requires disclosure to be in the acquisition note, information on intangible assets is sometimes disclosed in the intangible assets footnote. Other information (mainly qualitative) is sometimes disclosed in the MD&A.

TABLE 1
Descriptive Statistics—Sample Composition

Panel A: Sample Description

Total number of observations	1,019
Number of individual business combinations	713
Individual business combinations with additional information in aggregated business combinations	117
Number of aggregated business combinations with no additional information on the individual business combinations	143
Aggregated business combinations for which additional information on some of the individual business combinations exists	46

Panel B: Industry Affiliation of Firms in Sample

Industry Acronym	Two-Digit SIC Categories	Number of Obs.
Metal mining	10	5
Oil and gas extraction	13	23
Mining and quarrying of nonmetallic minerals, except fuels	14	3
Building construction—general contractors and operative builders	15	8
Heavy construction other than building construction contractors	16	3
Food and kindred products	20	33
Tobacco products	21	6
Apparel and other finished products made from fabrics and similar materials	23	18
Lumber and wood products, except furniture	24	8
Furniture and fixtures	25	7
Paper and allied products	26	30
Printing, publishing, and allied industries	27	20
Chemicals and allied products	28	79
Petroleum refining and related industries	29	14
Rubber and miscellaneous plastics products	30	7
Primary metal industries	33	21
Fabricated metal products, except machinery and transportation equipment	34	24
Industrial and commercial machinery and computer equipment	35	87
Electronic and other electric equipment and components, except computer equipment	36	120
Transportation equipment	37	33
Measuring, analyzing, and controlling instruments; photographic, medical, and optical goods; watches and clocks	38	88
Miscellaneous manufacturing industries	39	2
Motor freight transportation and warehousing	42	4
Water transportation	44	1
Transportation by air	45	3
Communications	48	32
Electric, gas, and sanitary services	49	39

(*continued on next page*)

TABLE 1 (continued)

Industry Acronym	Two-Digit SIC Categories	Number of Obs.
Wholesale trade—durable goods	50	3
Wholesale trade—non-durable goods	51	21
Building materials, hardware, garden supply, and mobile home dealers	52	3
General merchandise stores	53	10
Food stores	54	2
Automotive dealers and gasoline service stations	55	3
Apparel and accessory stores	56	2
Home furniture, furnishings, and equipment stores	57	3
Eating and drinking places	58	3
Miscellaneous retail	59	16
Hotels, rooming houses, camps, and other lodging places	70	6
Personal services	72	6
Business services	73	177
Automotive repair, services, and parking	75	2
Motion pictures	78	4
Amusement and recreation services	79	4
Health services	80	7
Engineering, accounting, research, management, and related services	87	7
Nonclassifiable establishments	99	22
Total		1,019

purchase price allocation for the aggregation of business combinations made by the acquirer during the year). Forty-six observations describe disclosure of aggregated business combinations in which there is further disclosure on some of the individual business combinations that compose the aggregation, and 143 observations describe disclosure of aggregated business combinations with no disclosure on the individual business combinations that compose the aggregation. Panel B presents the sample by industries. In all, 46 industries are represented. The number of firms in each industry ranges from 1 in the Water Transportation industry to 177 in the Business Services industry.

V. RESULTS

Descriptive Statistics

Table 2, Panel A, presents descriptive statistics of the hand-collected data.[12] The mean (median) purchase price in the sample is $667 ($125) million, and the mean (median) cash consideration is $298 ($73) million. The mean (median) ratio of the purchase price to the acquirer's market value is (Panel B) 6.2 (1.3) percent. In 72.5 percent of the acquisitions, acquirers provide a reason for the acquisition. Although paragraph 52 of SFAS No. 141 requires that acquirers disclose the primary reason for the acquisition in the notes to the financial reports, only 67 percent of the disclosures of the primary reason for the acquisition (49 percent of the overall business combinations) are made in the notes. The other common

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[12] The descriptive statistics presented in Table 2 are based only on disclosure on single business combinations. The statistics do not change significantly when observations of aggregated business combinations are included.

TABLE 2
Descriptive Statistics—Hand Collected Data

Panel A: Descriptive Statistics of Collected Data on Business Combinations

The sample consists only of individual acquisition observations (n = 830); amounts in millions of dollars.

Description	% Disc.	Mean	Std.	25th %	50th %	75th %	Min.	Max.
Total Purchase Price	98.1%	667	2573.7	38.0	125.2	377.0	1.0	55972.0
Cash Consideration	95.1%	297.8	695.7	22.1	73.0	274.2	0.0	7774.0
Stock Consideration	99.3%	334.9	2448.1	0.0	0.0	0.0	0.0	55972.0
Cash	28.8%	68.3	306.6	0.0	0.6	23.9	0.0	3615.0
Current Assets	34.1%	297.2	939.4	7.8	61.3	193.8	0.0	11968.0
Property, Plant, and Equipment	34.5%	472.1	1579.7	1.4	36.9	192.9	0.0	19269.0
In-Process R&D	59.6%	38.0	292.4	0.0	0.0	2.0	0.0	5052.0
Finite-Life Intangible Assets	66.6%	152.0	1390.3	2.3	14.8	52.5	0.0	31596.0
Indefinite-Life Intangible Assets	71.0%	54.9	331.2	0.0	0.0	0.0	0.0	5625.0
Total Intangibles	71.0%	202.1	1596.0	4.0	19.6	73.0	0.0	37221.0
Goodwill	80.1%	412.0	1431.6	11.0	60.0	232.5	0.0	20447.0
Deferred Tax Asset	32.3%	17.8	110.8	0.0	0.0	0.0	0.0	1475.0
Total Assets	43.1%	1493.2	3986.5	81.4	322.8	947.8	0.0	41639.0
Current Liabilities	30.6%	224.3	648.5	4.0	38.3	166.5	0.0	7523.0
Long-Term Debt	31.9%	247.7	814.0	0.0	0.0	64.5	0.0	8930.0
Total Long-Term Liabilities	29.8%	291.4	1041.1	0.0	3.4	121.4	0.0	12667.0
Deferred Tax Liability	32.3%	96.8	419.0	0.0	0.0	11.0	0.0	5393.0
Total Liabilities	43.1%	560.5	2000.8	6.3	45.0	241.0	0.0	25583.0
Purchase Price Allocation	33.7%	—	—	—	—	—	—	—
Primary Reason for Acquisition	72.5%	—	—	—	—	—	—	—
Factors that Contributed to the Purchase Price that Resulted in Goodwill	13.4%	—	—	—	—	—	—	—
Portion of Goodwill that Is Expected to Be Deducted for Tax Purposes	34.4%	—	—	—	—	—	—	—

(continued on next page)

TABLE 2 (continued)

Description	% Disc.	Mean	Std.	25th %	50th %	75th %	Min.	Max.
Breakdown of the Assignment of Goodwill to the Reporting Segments	63.9%	—	—	—	—	—	—	—
Amortization Period for Each Intangible Class	37.0%	—	—	—	—	—	—	—
Breakdown of the Amount Assigned to Intangible Assets to Major Intangible Classes	43.9%	—	—	—	—	—	—	—
Weighted Average Amortization	38.1%	—	—	—	—	—	—	—
Outside Valuation	22.0%	—	—	—	—	—	—	—
Pro forma Information	31.7%	—	—	—	—	—	—	—
Disclosure Score	—	0.482	0.241	0.295	0.444	0.704	0.037	1.000

Panel B: Ratios of Business Combinations

	% Disc.	Mean	Std.	25th %	50th %	75th %	Min.	Max.
Goodwill/Purchase Price	80.1%	0.554	0.357	0.324	0.600	0.788	0.000	4.000
Intangible Assets Separate from Goodwill/ Purchase Price	71.1%	0.239	0.239	0.071	0.190	0.324	0.000	1.397
(Goodwill + Intangible Assets Separate from Goodwill)/Purchase Price	68.0%	0.792	0.363	0.635	0.870	0.996	0.000	3.247
Purchase Price/Acquirer's Pre-Acquisition *BV*	98.1%	0.472	6.777	0.012	0.041	0.132	−2.146	191.513
Purchase Price/Acquirer's Pre-Acquisition *TA*	98.1%	0.087	0.283	0.006	0.018	0.058	0.000	4.021
Purchase Price/Pre-Acquisition Acquirer's *MV*	98.1%	0.062	0.157	0.004	0.013	0.043	0.000	1.866

Variable Definitions:
BV = book value of equity of the acquirer at the beginning of the fiscal year of the business combination;
TA = total assets of the acquirer at the beginning of the fiscal year of the business combination; and
MV = market value of equity of the acquirer two day before the business combination was consummated.

place for this disclosure is the MD&A. The quality of reasoning, however, varies greatly across firms. Here is an example of an informative and elaborate reason for acquisition:

> We expect the acquisition to strengthen our competitive position in the enterprise administration market by enabling us to deliver solutions that allow customers to build, manage and protect their IT infrastructures with end-to-end security management capabilities.[13]

On the other side of the scale are sparse explanations such as: "On September 22, 2003 in an effort to expand its media business the Company completed the acquisition of ..."[14] Only 13.4 percent of the acquirers disclose the factors that contributed to a purchase price that resulted in recognition of goodwill. Given the fact that the median portion of purchase price allocated to goodwill is 60 percent, 13.4 percent is quite a low figure. The values of intangible assets and goodwill are disclosed more often than any other asset acquired or liability assumed (71 percent and 80.1 percent, respectively). However, only 43.9 percent of the acquirers disclose the breakdown of the intangible assets to the intangible asset classes, 37 percent of the acquirers disclose the amortization period for each class of intangible assets, and 38.1 percent disclose the weighted average amortization period. In 34.4 percent of the business combinations, acquirers disclose the portion of goodwill that is expected to be deductible for tax purposes.

In 43.1 percent of the business combinations, acquirers disclose separately the assets acquired and the liabilities assumed. In 56.9 percent of the cases, assets are netted against liabilities. This, potentially, allows acquirers to conceal large amounts of liabilities assumed in the business combination. In 33.7 percent of the business combinations, acquirers disclose the purchase price allocation.[15] Twenty-two percent of the acquirers report that they used a third party to appraise one or more of the assets acquired. Overall descriptive statistics reflect varying levels of disclosure on business combinations within acquirers and between items for disclosure.

Empirical Analysis

This section outlines the empirical tests of my research hypotheses. To capture the level of disclosure on business combinations I construct a numerical disclosure score: the number of items disclosed in the business combination deflated by the maximum number of items relevant to this business combination.[16] Each item related to the business combination disclosed in the 10-K is equally weighted and receives 1 point. The maximum number of points, 27,[17] includes 23 items for which disclosure is mandatory in a material business combination, and four balance sheet captions (cash acquired, deferred tax, short-term debt, and the allocation of intangible assets to finite and indefinite life) that are not included in the illustration example in Appendix C of SFAS No. 141 but are reported in many cases.

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[13] Symantec acquired PowerQuest for a purchase price of $154 million (1.5 percent of Symantec market value).

[14] Univision acquired Hispanic Broadcasting Corporation for a purchase price of $3.35 billion (60 percent of Univision market value).

[15] Paragraph C2 of SFAS No. 141, which includes an illustration of the disclosure requirement of the purchase price allocation, details eight captions: current assets; property, plant, and equipment; intangible assets; goodwill; total assets acquired; current liabilities; long-term debt; and total liabilities assumed. For the purpose of this paper, disclosure of seven out of 12 items—the above eight plus four other balance sheet captions (cash acquired, deferred tax, short-term debt, and the allocation of intangible assets to finite and indefinite life) that are not detailed in the illustration example—is considered a disclosure of purchase price allocation.

[16] In the sample, 117 business combinations disclosed individually are also included in the disclosure of the aggregated amount for the year. In some cases (49 observations) the disclosure of the business combination individually did not include items that were disclosed in aggregate. To account for the fact that the aggregated information provides additional information, I correct the score for the individual business combination by adding to the score the ratio of the purchase price in the individual business combination to the aggregated purchase price. Results do not change when the correction is not made and when the corrected observations are excluded from the sample.

Factors that Affect Disclosure on Business Combinations

For descriptive purposes I begin by examining the unconditional relations between the disclosure score and (1) the ratio of goodwill to the purchase price (*GDWLCONS*), (2) the abnormal portion of the purchase price allocated to goodwill (*ABGDWL*), (3) the frequency of unexpected accruals (*EARNMAN_ACC*), and (4) the frequency of exactly meeting analysts' forecasts (*EARNMAN_MEET*).[18] The last two are proxies for a firm's inclination to manage earnings. Table 3 presents the mean and median disclosure scores of the sample partitioned to three equal-sized portfolios (1 = low, 2 = medium, 3 = high) sorted by each of the above-introduced variables. Table 3 also presents the mean and median disclosure score for each of the above portfolios partitioned into two portfolios: the first including business combinations with purchase price greater than 5 percent of the acquirer's total assets, and the second including business combinations with purchase price smaller than 5 percent of the acquirer's total assets.

I measure abnormal portion of the purchase price allocated to goodwill as the residuals of the following regression:[19]

$$GDWLCONS_i = \beta_1 + \beta_2 INDACQ_i + \beta_3 INDTRG_i + \beta_4 GROWTH_i + \varepsilon_i,$$

where *GDWLCONS* is the ratio of goodwill recognized in the business combination to the purchase price, *INDACQ* is the acquirer industry identified by the Compustat two-digit SIC code, *INDTRG* is the target industry identified by the Compustat two-digit SIC code, and *GROWTH* is the I/B/E/S median analyst long-term growth forecast for the acquirer.[20]

I measure unexpected accruals using the Kothari et al. (2005) performance-matched modified Jones model. Specifically, I estimate, for each two-digit standard industry code, the expected accruals (referred to as nondiscretionary) and then compute the unexpected accruals (discretionary) as the residuals from the regressions.[21] The frequency of unexpected accruals (*EARNMAN_ACC*) is the number of instances during the five years, ending in the

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[17] The maximum number of points can range from 21 to 27 because the maximum is corrected for observations in which goodwill and/or intangible assets are disclosed and equal 0. When both are 0, the disclosure of six items that are mandatory by SFAS No. 141 is not applicable (e.g., amortization period and factors contributing to the purchase price that resulted in goodwill).

[18] The association between meeting targets and earnings management was suggested by Burgstahler and Dichev (1997) (avoid loss and earnings decline) and by Degeorge et al. (1999) (meet analysts' forecasts).

[19] The subscript *i* represents a single transaction.

[20] Ideally I would like to control for the long-term growth expectation of the target. Since my sample includes a large number of private targets this is not possible. Although not perfect, it is reasonable to expect a positive correlation between an acquirer's and target's growth expectations.

[21] I estimate the following model:

$$TACC_{it} = \beta_1 + \beta_2\left(\frac{1}{TA_{it-1}}\right) + \beta_3(\Delta REV_{it} - \Delta AR_{it}) + \beta_4 PPE_{it} + \beta_5 ROA_{it} + \varepsilon_{it},$$

where $TACC_{it}$ is total accruals for firm i at year t, TA_{it-1} is total assets at t–1, ΔREV_{it} is the change in revenues between year t and year $t-1$, ΔAR_{it} is the change in accounts receivable between year t and year $t-1$, PPE_{it} is net property, plant, and equipment in year t, and ROA_t is the return on assets at year t. I deflate all variables by total assets in order to control for differences in firm size. Following Hribar and Collins (2001), all variables are measured from the cash flow statement.

TABLE 3
Descriptive Statistics: Sample Partitioned to Portfolios

	GDWLCONS			*ABGDWL*			*EARNMAN_ACC*			*EARNMAN_MEET*		
Sorting Variable	**High**	**Medium**	**Low**	**High**	**Medium**	**Low**	**High**	**Medium**	**Low**	**High**	**Medium**	**Low**
Mean	0.49	0.50	0.54	0.52	0.51	0.52	0.46	0.45	0.48	0.48	0.53	0.54
Median	0.44	0.44	0.52	0.48	0.44	0.44	0.37	0.41	0.44	0.41	0.44	0.52
Purchase Price >5%												
Mean	0.61	0.62	0.69	0.64	0.61	0.66	0.63	0.64	0.62	0.64	0.64	0.66
Median	0.63	0.63	0.74	0.70	0.63	0.70	0.63	0.67	0.67	0.67	0.70	0.74
Purchase Price <5%												
Mean	0.43	0.44	0.50	0.44	0.45	0.49	0.45	0.39	0.42	0.36	0.40	0.44
Median	0.37	0.40	0.44	0.37	0.41	0.44	0.33	0.37	0.37	0.33	0.33	0.41

High, Medium, and Low are three equal-sized portfolios sorted by the sorting variable. Purchase Price >5% is when the purchase price is greater than 5 percent of the acquirer's total assets.

Variable Definitions:

GDWLCONS = ratio of goodwill recognized to the total purchase price;
ABGDWL (abnormal goodwill) = residuals from a regression of *GDWLCONS* on the industries of the target and the acquirer and on past and expected growth of the acquirer;
EARNMAN_ACC = number of times, in the five years ending in the year of the business combination, of positive or extreme negative unexpected accruals deflated by the total number of years; and
EARNMAN_MEET = number of times, in the 20 quarters ending in the year of the business combination, of the acquirer's earnings falling between −0.5 cent and +0.5 or −20 cents from the median analysts' forecasts.

financial year of the business combination, when the acquirer had either positive unexpected accruals (upward earnings management) or extreme (greater than 20 percent of the firm's total assets) negative unexpected accruals (big bath) deflated by the total number of years with available data (five, in most cases). The frequency of exactly meeting analysts' forecasts (*EARNMAN_MEET*) is the number of times that the actual quarterly earnings per share is in the range of -0.5 cents and $+0.5$ cents[22] of the median analysts' forecasts (exactly meet) or that actual quarterly earnings per share is at least 20 cents lower than analysts' forecasts (big bath) deflated by the total number of quarters with available data (20, in most cases).

Table 3 displays a higher level of disclosure when purchase price is greater than 5 percent of the acquirer's total assets. While both the mean and the median disclosure scores decrease monotonically from the portfolio of Low amounts allocated to goodwill to the portfolio of High amounts allocated to goodwill, this pattern disappears when controlling for the economic factors that may drive goodwill. Thus, disclosure score does not change between portfolios sorted by abnormal goodwill (*ABGDWL*). When partitioning is performed on the proxies for earnings management, only the measure related to meeting analysts' forecasts (*EARNMAN_MEET*) displays monotonic decrease in the disclosure score from the Low portfolio to the High portfolio. Only the median disclosure score displays a monotonic decrease from the Low portfolio to the High portfolio of the frequency of unexpected accruals.

The regression analysis is presented next. I estimate the following model:

$$\begin{aligned} DISCSCORE_i = {} & \beta_1 + \beta_{2\text{–}4}YEAR(2002\text{–}2004)_i + \beta_5 LNCONS_i + \beta_6 RELCONS_i \\ & + \beta_{7\text{–}9}MAT(1,5,10)_i + \beta_{10}MATEAR_i + \beta_{11}TA_i + \beta_{12}CONSTYPE_i \\ & + \beta_{13}ABGDWL_i + \beta_{14}EARNMAN(ACC/MEET)_i \\ & + \beta_{15}STOCKCOMP_i + \beta_{16}LNHOLDINGS_i + \beta_{17}INSOWN_i \\ & + \beta_{18}INVDED_i + \beta_{19}INVQUAS_i + \beta_{20}INVTRA_i \\ & + \beta_{21}COUNTANA_i + \varepsilon_i. \end{aligned}$$

Since different lines of business may have different disclosure practices that are founded, among other things, in the differences in the portion of information that is proprietary, this model is estimated using industry fixed effects. Industries are identified using standard Compustat two-digit SIC codes.[23] The dependent variable in this model is the disclosure score (*DISCSCORE*). The control variables in the regression are the following: *YEAR* consists of three binary variables for the years 2002–2004 (base year 2001), which control for the possible changes in disclosure levels following the Sarbanes-Oxley Act of 2002. *TA* is acquirer's total assets at the beginning of the year. Though the sample is composed exclusively of S&P 500 firms, there could still be variations in disclosure level due to size. *CONSTYPE*, the ratio of stock consideration to the purchase price, controls for variations in the level of disclosure that are related to overvaluation of the consideration. Myers and Majluf (1984) find that a bidding firm will offer to issue stocks to finance an investment when it has superior information and it believes the stock to be overvalued. Penman (2003) suggests that equity consideration is a way of locking value of an overvalued share. *STOCKCOMP/LNHOLDINGS* controls for stock-based incentives to the CEO. Nagar et al. (2003) find that stock-based incentives to the CEO are positively associated with the number of earnings forecasts issued by the firm. *STOCKCOMP* is measured as the three-year average of the value of restricted shares granted to CEOs plus the net value of stock options grants deflated by the total compensation to the CEO for the year, and *LNHOLDINGS* is the natural logarithm of the value of the CEO's stock holdings. *INSOWN* controls for inside ownership. Nagar et al. (2003) and Eng and Mak (2003) find that the levels of inside ownership are negatively associated with the level of disclosure. Inside ownership is measured as the number of shares held by insiders deflated by the total number of shares outstanding. *INVDED/INVQUAS/INVTRA* controls for institutional ownership. Bushee and Noe (2000) find that the three classes of institutional investor—dedicated, quasi-indexer, and transient—show different sensitivity to disclosure level. The dedicated institutional investors are less sensitive than the other groups because they receive their information from alternative sources. Each variable is measured as the ratio of each type of the institutional investors to the total number of shares outstanding, using Bushee's (1998) classification of institutional investors.[24] *COUNTANA* controls for analysts' coverage. Lang and Lundholm (1996) document the positive relation between analysts' coverage and disclosure levels. They find that the disclosure leads the coverage and not the opposite. Table 4 provides descriptive statistics of the variable used in the regression.

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[22] Results hold if the range of exactly meeting analysts' forecasts is between 0 and 1 cent.

[23] As a robustness test I use the Fama and French (1996) industry classification. Results are robust to the change.

Materiality Judgment Effects on Disclosure on Business Combinations

Since the FASB does not suggest a specific guidance on materiality thresholds for business combinations, there is no natural benchmark to test materiality. I consider four alternative measures of the size of the business combination, one absolute and three relative, to capture materiality considerations in disclosure on business combinations:

(1) Purchase price (*LNCONS*): the natural logarithm of the purchase price. Although in SFAC No. 2 the FASB indicates that materiality judgment should be based on relative size, I include this variable to test whether acquirers comply with this FASB guidance. I do not expect this variable to explain disclosure level.
(2) Market value-based (*RELCONS*): the ratio of the purchase price to the acquirer's market value prior to the effective date of the business combination.
(3) Total assets-based thresholds (*MAT1*, *MAT5*, *MAT10*): I partition the sample into four portfolios sorted by the purchase price relative to total assets of the acquirer—below 1 percent of total assets (base portfolio—379 observations), between 1 percent and 5 percent of total assets (362 observations), between 5 percent and 10 percent of total assets (107 observations), and above 10 percent of total assets (153 observations)—and create three binary variables, one for each non-base portfolio, each receiving the value 1 if the observation is included in the portfolio, and 0 otherwise.
(4) Earnings-based: since earnings can be negative or very close to zero, I sort the ratio of the purchase price to acquirer's earnings into ten equal-sized portfolios and use a rank variable in the regression. Because income could vary substantially

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[24] I thank Brian Bushee for providing me with the data on the institutional investors' classification. The three classes are dedicated—characterized by large stable holdings in a small number of firms; quasi-indexer—holding large diversified portfolios and trading very infrequently; and transient—trading aggressively based on short-term news. For further information about the method of classification see Bushee (1998).

TABLE 4
Descriptive Statistics of Explanatory Variables

Variable	Mean	Std.	Median	Min.	Max.
DISCSCORE	0.48	0.24	0.44	0.04	1
ABGDWL	0	0.30	0	−0.82	2.77
EARNMAN_ACC	0.41	0.29	0.40	0.00	1.00
EARNMAN_MEET	0.25	0.17	0.20	0	0.95
STOCKCOMP	0.59	0.21	0.61	0.00	1.00
LNHOLDINGS	9.79	2.19	9.61	−3.13	17.56
INSOWN	2.5%	6.5%	0.3%	0.0%	81.3%
INVDED	9.6%	7.2%	7.9%	0.0%	37.4%
INVQUAS	34.5%	10.6%	33.6%	4.4%	67.5%
INVTRA	25.0%	10.2%	23.4%	4.5%	67.6%
COUNTANA	24.0	11.4	22.0	2.0	60.0

Variable Definitions:

DISCSCORE = disclosure score for the observation. It is computed as the addition of the equally weighted data items disclosed in the 10-K deflated by the maximum number of items possible to disclose;

ABGDWL (abnormal goodwill) = residuals from a regression of *GDWLCONS* on the industries of the target and the acquirer and on expected growth of the acquirer;

EARNMAN_ACC = number of times, in the five years ending in the year of the business combination, of positive or extreme negative unexpected accruals deflated by the total number of years;

EARNMAN_MEET = number of times, in the 20 quarters ending in the year of the business combination, of the acquirer's earnings falling between −0.5 cent and +0.5 or −20 cents from the median analysts' forecasts;

STOCKCOMP = three-year average of the ratio of stocks and options grants to the total annual compensation to the CEO;

LNHOLDINGS = natural logarithm of the three-year average of value of the stock holding of the CEO;

INSOWN = ratio of the acquirer's shares that are owned by insiders to the total number of shares outstanding;

INVDED, *INVQUAS*, and *INVTRA* = ratios of acquirers' shares owned by dedicated/quasi-indexers/transient institutional investors as defined in Bushee (1998) to the total shares outstanding; and

COUNTANA = number of analysts covering the acquirer in the year of the business combination.

between years, this threshold may be more appealing to acquirers, as it gives them more discretion in disclosure.[25]

Results in Table 5 suggest that the materiality metric that best explains disclosure level on business combinations is the ratio of the purchase price to the acquirer's pre-acquisition total assets. When controlling for the relation between the purchase price and the acquirer's total assets, the purchase price, the ratio of the purchase price to the acquirer's pre-acquisition market value, and the ratio of the purchase price to the acquirer's earnings are all nonsignificant. Business combination disclosure level increases significantly when the

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[25] I conduct several robustness tests, including (1) transforming *RELCONS* to a ten-rank variable, (2) transforming *RELCONS* to a three-threshold variable (in the same way as *MAT1–MAT10*), and (3) transforming the ratio of purchase price to total assets to a ten-rank variable replacing the three-threshold variable. All specifications provide similar results.

TABLE 5
Industry Fixed-Effects Regression Results for Disclosure Score[a]

$$\begin{aligned} DISCSCORE = {} & \beta_1 + \beta_{2\text{–}4}YEAR_i + \beta_5 LNCONS_i + \beta_6 RELCONS_i \\ & + \beta_{7\text{–}9}(MAT1_i/MAT5_i/MAT10_i) + \beta_{10} MATEAR_i + \beta_{11} TA_i \\ & + \beta_{12} CONSTYPE_i + \beta_{13}(ABGDWL/GDWLCONS)_i \\ & + \beta_{14} EARNMAN(ACC/MEET)_i + \beta_{15} STOCKCOMP_i \\ & + \beta_{16} LNHOLDINGS_i + \beta_{17} INSOWN_i + \beta_{18} INVDED_i \\ & + \beta_{19} INVQUAS_i + \beta_{20} INVTRA_i + \beta_{21} COUNTANA_i + \varepsilon_i \end{aligned}$$

Variables	Prediction	(1)	(2)	(3)	(4)	(5)	(6)
Materiality							
LNCONS	?	0.009	0.009	−0.002	0	0.002	0.000
		(1.00)	(1.07)	(−0.17)	(0.01)	(0.19)	(−0.04)
RELCONS	+	0.101	0.088	0.196	0.166	0.169	0.164
		(1.33)	(1.10)	(1.94)	(1.64)	(1.59)	(1.61)
MAT1	+	0.020	0.054	0.061	0.063	0.063	0.064
		(0.92)	(2.16)	(2.34)	(2.43)	(2.27)	(2.47)
MAT5	+	0.116	0.120	0.167	0.176	0.162	0.178
		(3.36)	(3.43)	(4.15)	(4.38)	(3.07)	(4.42)
MAT10	+	0.187	0.192	0.250	0.258	0.274	0.261
		(4.64)	(4.73)	(5.13)	(5.32)	(3.94)	(5.37)
MATEAR	?	0	0	−0.001	−0.002	−0.006	−0.002
		(0.02)	(−0.12)	(−0.26)	(−0.40)	(−1.31)	(−0.41)
Control							
TA	?	−0.288	−0.300	−0.554	−0.588	−0.727	−0.569
		(−0.93)	(−0.97)	(−1.46)	(−1.57)	(−1.75)	(−1.52)
CONSTYPE	?	−0.035	−0.030	−0.026	−0.029	−0.021	−0.030
		(−1.32)	(−1.12)	(−0.84)	(−0.92)	(−0.65)	(−0.98)
Explanatory							
GDWLCONS	−						−0.087
							(−3.23)
ABGDWL	−	−0.079	−0.075	−0.094	−0.091	−0.118	
		(−3.21)	(−2.99)	(−3.39)	(−3.30)	(−4.24)	
EARNMAN_ACC	−		−0.064		−0.065		−0.065
			(−2.12)		(−1.82)		(−1.82)
EARNMAN_MEET	−					−0.132	
						(−2.46)	
Control—Incentives							
STOCKCOMP	?			−0.111	−0.107	−0.099	−0.106
				(−2.25)	(−2.16)	(−1.89)	(−2.14)
LN_HOLDINGS	?			−0.007	−0.007	−0.006	−0.007
				(−1.79)	(−1.74)	(−1.42)	(−1.73)
INSOWN	−			−0.432	−0.474	−0.477	−0.474
				(−2.95)	(−3.27)	(−3.17)	(−3.27)
INVDED	−			−0.006	−0.006	−0.007	−0.006
				(−4.28)	(−4.23)	(−5.19)	(−4.23)

(*continued on next page*)

TABLE 5

Variables	Prediction	(1)	(2)	(3)	(4)	(5)	(6)
INVQUAS	?			−0.003	−0.003	−0.002	−0.03
				(−2.75)	(−2.28)	(−1.85)	(−2.32)
INVTRA	?			−0.002	−0.002	−0.002	−0.002
				(−1.66)	(−1.36)	(−1.84)	(−1.39)
COUNTANA	+			0.003	0.003	0.003	0.003
				(3.01)	(3.10)	(2.94)	(3.13)
Intercept		0.443	0.475	0.740	0.736	0.757	0.787
		(9.80)	(9.51)	(7.52)	(7.48)	(7.57)	(7.80)
n		716	689	525	511	466	511
Adjusted R^2		18.4%	18.7%	26.7%	28.3%	28.5%	28.9%

t-statistics in parentheses.

[a] For compactness, coefficients on the *YEAR* variables are suppressed.

Variable Definitions:

DISCSCORE = disclosure score for the observation; it is computed as the addition of the equally weighted data items disclosed in the 10-K deflated by the maximum number of items for disclosure;

YEAR = three binary variables for the years 2002–2004;

LNCONS = natural log of the purchase price;

RELCONS = ratio of the purchase price to the acquirer's market value two days before the acquisition was consummated;

MAT1 = binary variable equal to 1 if the ratio of the purchase price to the acquirer's total assets is between 1 percent and 5 percent;

MAT5 = binary variable equal to 1 if the ratio of the purchase price to the acquirer's total assets is between 5 percent and 10 percent;

MAT10 = binary variable equal to 1 if the ratio of the purchase price to the acquirer's total assets is above 10 percent;

TA = acquirer's total assets at the beginning of the year (in millions);

CONSTYPE = ratio of stock consideration to the purchase price;

GDWLCONS = ratio of goodwill recognized in the business combination to the purchase price;

ABGDWL (abnormal goodwill) = residuals from a regression on the industries of the target and the acquirer and on past and expected growth of the acquirer;

EARNMAN_ACC = number of times, in the five years ending in the year of the business combination, of positive or extreme negative unexpected accruals deflated by the total number of years;

EARNMAN_MEET = number of times, in the 20 quarters ending in the year of the business combination, of the acquirer's earnings falling between −0.5 cent and +0.5 or −20 cents from median analysts' forecasts;

STOCKCOMP = three-year average of the ratio of stocks and options grants to the total annual compensation to the CEO;

LN_HOLDINGS = natural log of the three-year average of value of the stock holding of the CEO;

INSOWN = ratio of the acquirers' shares that are owned be insiders to the total shares outstanding;

INVDED, *INVQUAS*, and *INVTRA* = ratios of acquirers' shares owned by dedicated/quasi-indexers/transient institutional investors as defined in Bushee (1998) to the total shares outstanding; and

COUNTANA = number of analysts that cover the firm for the financial year; industries are identified using standard two-digit SIC codes.

purchase price is greater than 5 percent of the acquirer's pre-acquisition total assets. An additional increase is observed when the purchase price is greater than 10 percent of the acquirer's pre-acquisition total assets. Using total assets as the main materiality metric is consistent with the SEC's frequent use of total assets as the metric relative to which the purchase price is measured for the purpose of disclosure.[26]

In order to investigate whether firms employ materiality constraint equally on all items subject to disclosure, I test the correlation between the disclosure of the purchase price allocation and the disclosure of the pro forma income statement, two items that SFAS No. 141 requires acquirers to disclose if the business combination is material.[27] These two items are among the most informative on the potential effects of a business combination. The correlation between the disclosure of the purchase price allocation and the disclosure of the pro forma income statement is 0.4. Out of 830 business combinations, 225 disclosed one and not the other, 159 disclosed both, and 446 disclosed neither. The number of acquirers that disclose one item and not the other suggests that acquirers are often not consistent in classifying a business combination as material.

H1: Abnormal Goodwill and Disclosure on Business Combinations

Results in Table 5 show that the disclosure level on business combinations decreases with abnormal levels of goodwill (reg. 4, coefficient estimate = −0.091, t-stat = −3.30). The result holds in all specifications and is consistent with managerial incentives not to disclose "bad news" associated with abnormal amounts of goodwill (possible overpayment or artificial overstatement of goodwill in the purchase price allocation). Because, as noted in footnote 21, an acquirer's expected growth rates (which I use in order to control for normal goodwill level) may not capture the target's expected growth rates, I also report in Table 5 results for a regression in which the ratio of goodwill to purchase price is used instead of abnormal goodwill (reg. 6). In addition, for robustness purposes I conduct the tests for the subsample of publicly traded targets for which I can identify growth forecasts in I/B/E/S database (not tabulated). Results for abnormal goodwill are not materially different.[28]

Since goodwill represents less reliably measured growth opportunities, firms reluctant to provide non-reliable information are expected to provide less information on the nature of the goodwill. This does not confound, however, results in this study as only two items—"factors contributing to recognition of goodwill" and "primary reason for acquisition"—require qualitative disclosure that may involve growth opportunities that are not reliably measured. All other items that compose the disclosure score, which include details about the transaction, the breakdown of the purchase price to the assets acquired and liabilities assumed, information about intangible assets, and pro forma information, are already realized at the time of disclosure. Together, their disclosure enables investors to evaluate causes and effects of the acquisition (e.g., information on whether the target is free of liabilities or whether large liabilities, which reduce net value of identified assets, were assumed, contributing to the high goodwill recognized). The disclosure score, which is a reflection of the disclosure requirement in SFAS No. 141, is therefore not sensitive to the low reliability of growth options measures.

Earnings Management and Disclosure on Business Combinations

Results in Table 5 also display a negative association between the disclosure score and the frequency of unexpected accruals (reg. 4, coefficient estimate = −0.065, t-stat = −1.82) and the frequency of exactly meeting analysts' forecasts (reg. 5, coefficient estimate $= -0.132$, t-stat $= -2.46$). These two measures are necessary but not sufficient to indicate earnings management. To the extent that these measures do capture inclination to manage earnings, this result suggests that when acquirers resort more often to earnings management, they tend to disclose less information on business combinations, presumably to increase their flexibility with future reporting numbers.

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[26] Rodrigues and Stegemoller (2006) review the specific thresholds used by the SEC for different acquisitions.

[27] For purchase price allocation, see paragraph 52; for pro forma information, see paragraph 54.

[28] Because the number of target firms for which I can identify growth forecasts is relatively small, I do not control for industry differences using fixed effects.

Disclosure Level on Business Combinations and Acquirer's Performance

I begin by conducting portfolio analysis. In Table 6, I partition the sample into five equal-sized portfolios sorted by the level of abnormal disclosure (*AB_DISC*). For each portfolio I measure the mean of the following four variables: change in acquirer's *ROA* one year (ΔROA_t) and two years (ΔROA_{t+1}) ahead of the business combination, acquirer's abnormal stock return a year after the disclosure (AB_RET_{year}), and acquirer's abnormal stock return in the disclosure period (AB_RET_{sw}).

AB_DISC is measured as the residuals from an industry fixed-effects regression of the disclosure score on the factors that represent the business combination materiality. Since one acquirer may have made more than one acquisition in a single year, in order to provide a measure of abnormal disclosure per acquirer per year, I calculate a weighted average for each firm year. Each observation receives a weight equal to the ratio of the purchase price to the aggregated purchase price for acquisitions made by the firm during the year. ΔROA is measured as the percentage change in *ROA* from the financial year in which the business combination was consummated (year t) to the following year ($t+1$). ROA_t is measured as the income before extraordinary items (Compustat #18) in year t deflated by the average of total assets in years t and $t-1$. ROA_{t+1} is measured in a similar way. AB_RET_{year}, the cumulative abnormal returns of the combined entity, is measured using a Fama and French (1996) three-factor model from the day of the disclosure to 250 trading days after the disclosure date. AB_RET_{sw} is similarly measured from the filing date to three trading days after the filing date.[29]

Table 6 displays a monotonic increase from portfolio 1 to portfolio 5 in ΔROA in the first year following the business combination. The difference in ΔROA between portfolio 1 (lowest level of disclosure) and portfolio 5 (highest level of disclosure) is 3 percent ΔROA. In the second year following the business combination, portfolios 3–5 perform better than portfolios 1 and 2, though there is no monotonic increase. AB_RET_{year} also displays a monotonic increase from portfolio 1 to portfolio 5 of abnormal disclosure. The difference in abnormal returns is 9.6 percent. When the short window return is measured there are no significant differences between the portfolios. These statistics provide initial evidence on the association between disclosure on business combinations and future performance and on investors' failure to fully account for this association at the time of disclosure.

H2: Disclosure and Post-Acquisition Performance

To test the relation between abnormal disclosure and acquirers' performance, I estimate the following models using industry fixed effects. Industries are identified using standard Compustat two-digit SIC codes:

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[29] When using event study methodology, researchers tend to include one or a few days prior to the event, assuming the information has been leaked. This assumption does not hold in this study, as the acquisition itself was made in the past and the information provided in the 10-K is extensive and complex and does not include a summary measure (e.g., earnings per share) that can be leaked.

TABLE 6
Portfolio Analysis: Sample Partitioned to Portfolios of Abnormal Disclosure

Sorting Variable	***AB_DISC***				
Performance	**1**	**2**	**3**	**4**	**5**
ΔROA_t	−0.005	0.010	0.011	0.012	0.025
ΔROA_{t+1}	0.008	0.003	0.011	0.009	0.012
AB_RET_{year}	−0.104	−0.084	−0.045	−0.026	−0.006
AB_RET_{sw}	−0.001	0	−0.012	−0.001	−0.004

Sample partitioned to five equal-sized portfolios sort by *AB_DISC*.

Variable Definitions:

AB_DISC = residuals of an industry fixed-effects regression of the disclosure score (*DISCSCORE*) on the purchase price, the ratio of the purchase price to the acquirers' market value, and three binary variables, each for one threshold (1 percent, 5 percent, and 10 percent), of the ratio of the purchase price to acquirers' pre-acquisition total assets;

ΔROA_t (ΔROA_{t+1}) = change in *ROA* from year *t* (*t*+1) to year *t*+1 (*t*+2);

AB_RET_{year} = abnormal stock return from the 10-K filing date to 250 trading days after the filing date; abnormal returns are computed using the Fama and French (1996) three-factor model; and

AB_RET_{sw} = abnormal stock returns for four days starting with the 10-K filing date to three days after the filing; abnormal returns are computed using the Fama and French (1996) three-factor model.

$$\Delta ROA_{it} = \beta_1 + \beta_2 AB\_DISC_i + \beta_3 TA_{it} + \beta_4 MB_{it} + \beta_5 LAGROA_{it} + \varepsilon_{it},$$

and:

$$\Delta ROA_{it+1} = \beta_1 + \beta_2 AB\_DISC_i + \beta_3 TA_{it+1} + \beta_4 MB_{it+1} + \beta_5 LAGROA_{it+1} + \varepsilon_{it},$$

where ΔROA_{it} (ΔROA_{it+1}) is the percentage change in *ROA* from year *t* (*t*+1) to year *t*+1 (*t*+2), AB_DISC_i is the abnormal disclosure, TA_{it} (TA_{it+1}) is the acquirer's total assets at year *t* (*t*+1), MB_{it} (MB_{it+1}) is the acquirer market-to-book ratio measured at year *t* (*t*+1), and $LAGROA_{it}$ ($LAGROA_{it+1}$) is the acquirer's *ROA* at year *t* (*t*+1). Results in Table 7 display evidence consistent with the descriptive statistics and with H2; acquirers' performance as measured by the change in *ROA* in the first year and in the second year following the business combination increases with acquirers' abnormal disclosure level (reg. 1, coefficient estimate = 0.031, t-stat = 1.77, reg. 2, coefficient estimate = 0.036, t-stat = 2.69). In terms of economic significance, every standard deviation change in the abnormal disclosure score corresponds to half a percent in *ROA* in the first year following the business combination. To corroborate these results I also estimate the associations between abnormal disclosure levels on business combinations and acquirers' stock returns. I estimate the following model:

$$\begin{aligned} AB\_RETyear_i = {} & \beta_1 + \beta_2 AB\_DISC_i + \beta_3 EAR_i + \beta_4 \Delta EAR_i + \beta_5 GR_i * EAR_i \\ & + \beta_6 GR_i * \Delta EAR_i + \varepsilon_i, \end{aligned}$$

where EAR_i is standardized earnings levels and ΔEAR_i is standardized earnings changes. Each earnings variable is standardized by the market value of equity at the time of

TABLE 7
Regressions of Change in ROA, One Year Forward Abnormal Stock Return, and Short Window Abnormal Returns on Abnormal Disclosure

Dependent Variable	Pred.	$\Delta ROA_t{}^a$	$\Delta ROA_{t+1}{}^a$	AB_RET_{year}	AB_RET_{sw}
Explanatory					
AB_DISC	+	0.031	0.036	0.167	−0.001
		(1.77)	(2.69)	(2.25)	(−0.14)
Control					
EAR	+			0.785	
				(1.95)	
ΔEAR	−			−0.020	
				(−1.86)	
$GR*EAR$	+			−0.015	
				(−0.41)	
$GR*\Delta EAR$	+			0.001	
				(2.26)	
$TA_{t(t+1)}$	−	−0.022	−0.049		
		(−0.34)	(−0.52)		
$MB_{t(t+1)}$	+	0.001	0.000		
		(2.01)	(1.11)		
$LAGROA_{t(t+1)}$	−	−0.489	−0.475		
		(−14.35)	(−16.22)		
Intercept		0.030	0.033	−0.111	−0.004
		(7.41)	(10.51)	(−6.96)	(−1.92)
Number of observations		474	462	476	479
Adjusted R^2		31.1%	37.1%	3.4%	0%

t-statistics in parentheses.

[a] Estimated using acquirers' industry fixed effects.

Variable Definitions:

AB_DISC = residuals of an industry fixed-effects regression of the disclosure score (*DISCSCORE*) on the purchase price, the ratio of the purchase price to the acquirers' market value, and three binary variables, each for one threshold (1 percent, 5 percent, and 10 percent), of the ratio of the purchase price to acquirers' pre-acquisition total assets;

ΔROA_t (ΔROA_{t+1}) = change in *ROA* from year *t* (*t*+1) to year *t*+1 (*t*+2);

AB_RET_{year} = abnormal stock return from the 10-K filing date to 250 trading days after the filing date; abnormal returns are computed using the Fama and French (1996) three-factor model;

AB_RET_{sw} = abnormal stock returns for four days starting with the 10-K filing date to three days after the filing; abnormal returns are computed using the Fama and French (1996) three-factor model;

EAR = earnings levels in the fiscal year that follows the business combinations deflated by the acquirers' market value of equity at the time of disclosure;

ΔEAR = change in earnings from the fiscal year of the business combination to the following year deflated by the acquirers' market value of equity;

$GR*EAR$ = interaction between *EAR* and acquirers' median analysts' long-term growth forecasts;

$GR*\Delta EAR$ = interaction between ΔEAR and acquirers' median analysts' long-term growth forecasts;

$TA_{t(t+1)}$ = acquirers' total assets at the beginning of year *t* (*t*+1);

$MB_{t(t+1)}$ = acquirers' market to book ratio in year *t* (*t*+1); and

$LAGROA_{t(t+1)}$ = acquirers' *ROA* at the fiscal year of the business combination (one year following the business combination).

disclosure. GR_i is median analysts' long-term growth forecasts.[30] Results are consistent with the results on *ROA*: stock returns in the year following disclosure increase with abnormal disclosure level on business combinations (reg. 3, coefficient estimate = 0.167, t-stat = 2.25). In terms of economic significance, every standard deviation change in the abnormal disclosure corresponds to 3 percent in returns.

H3: Investors' Reaction to Disclosure on Business Combinations

In light of the evidence on the association between disclosure level on business combinations and acquirers' future performance, the question remaining is whether investors understand the association between the level of information provided and its favorability. To answer this question, I estimate the following univariate model for the event window:

$$AB\_RETsw_i = \beta_1 + \beta_2 AB\_DISC_i + \varepsilon_i.$$

Table 7 contains results of estimating this model, which suggest that investors do not seem to understand the information contained in the level of disclosure on business combinations. The coefficient on *AB_DISC* is not significant in explaining abnormal return in the event window of three days following the disclosure on the 10-K.[31] Most theoretical models assume simple information, often of one type, which can be easily interpreted by investors. These models predict a drop in stock price following incomplete information. Dye (1985, 1986) suggests that when information is more complex (includes proprietary and nonproprietary information), investors may react less strongly to incomplete information. My results may suggest that when information is complex (materiality constraint employed on each item, which creates a "level of disclosure" instead of a simple "yes/no disclosure"), investors are not always able to interpret whether disclosure is full or incomplete.

Because the 10-K is released a reasonably long time after the acquisition, and some data on the acquisition is already available (through press releases, 8-Ks, 10-Qs, and, if the target is publicly traded, its financial report), it is possible that investors do not misinterpret the information provided in the 10-K because there is no new information to interpret. To alleviate this concern I perform all the tests that use the date of 10-K filings to measure returns on a subsample that excludes: (1) publicly traded targets, (2) acquisitions in which the purchase price is greater than 10 percent of the acquirer's total assets (for such acquisitions the SEC requires an 8-K filing), and (3) acquisitions that were made more than four months before the end of the fiscal year, for which some information may be available on the 10-Q. All results hold.

When Do Investors "Get It"?

Given that results suggest that there is a time lag between the release of information and the time the information (or lack of) is priced into stocks, a follow-up question is how quickly do investors internalize the differences in disclosure levels?

Figure 1 plots the cumulative daily abnormal returns from the filing of the 10-K to 250 trading days after the filing for five equal-sized portfolios sorted by *AB_DISC*. Portfolios

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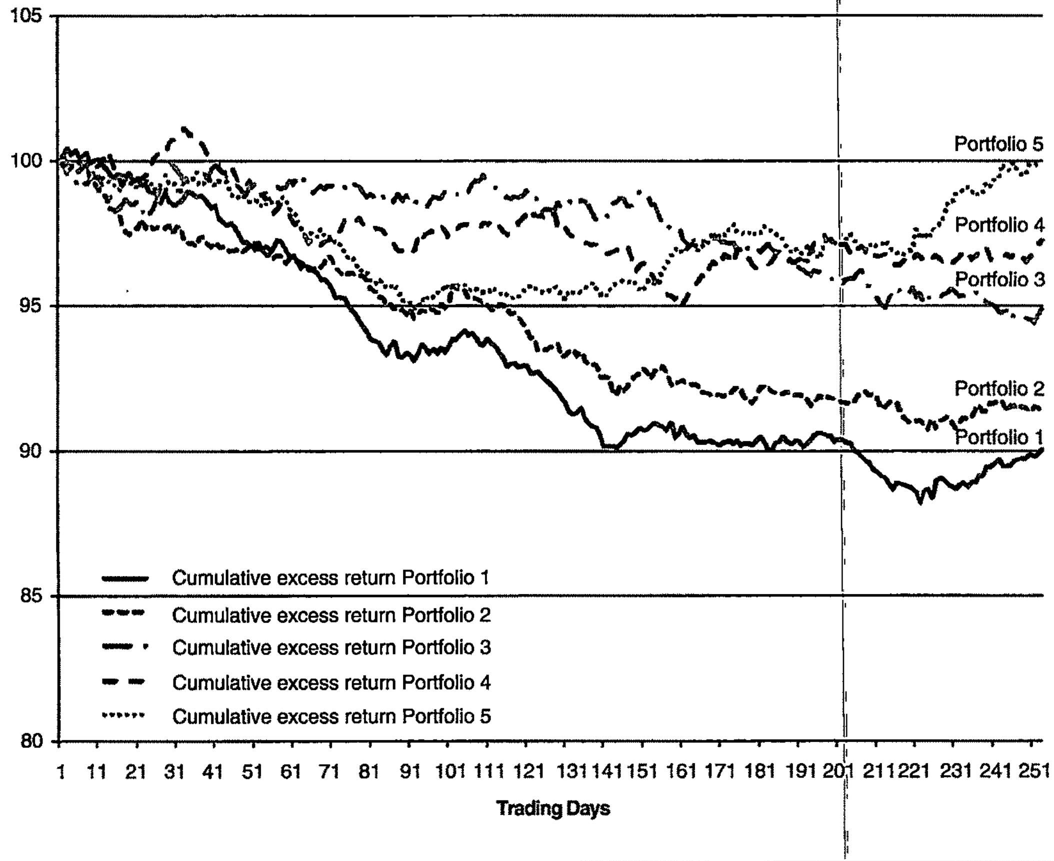
[30] In this model I follow the specification of model 1 in Healy et al. (1999) with two modifications: (1) I use analysts' I/B/E/S long-term growth forecasts to proxy for growth, because actual sales growth is mechanically affected by M&A; (2) I use Fama and French (1996) three-factor model returns instead of raw returns and therefore I do not control for the beta at the right side of the equation.

[31] Because abnormal disclosure is measured on the 10-K filing date, the power of the test is lower than it would have been if measured on other dates on which accounting information is released.

FIGURE 1
Daily Cumulative Abnormal Returns
Five Portfolios Sorted by *AB_DISC*



1 and 2 (low abnormal disclosure) perform significantly worse than portfolios 3–5 (medium and high abnormal disclosure) shortly following the release of information. However, whereas portfolio 2 outperforms portfolio 1 less than a quarter following the disclosure, it takes portfolio 5 almost three quarters to outperform portfolios 3 and 4, consistent with investors adapting their expectations more quickly to low abnormal disclosure firms. Because the test in Figure 1 is not conditioning on other factors that may affect returns, all inference from it is subject to these limitations.

Overall, results suggest that acquirers withhold bad news about business combinations and that investors do not fully internalize this at the time the information is released. Investors seem to adapt their expectations more quickly for firms with low abnormal disclosure.

I cannot, however, completely rule out the possibility that the association between abnormal disclosure and performance also captures a more general characteristic of the firm that distinguishes between a "good" and a "bad" firm and that information about the "quality" of the firm is revealed during the year after disclosure, although the controls used in this study decrease the possibility of such an explanation. Nevertheless, even if the quality of the business combination does not account for the full effect on performance, results suggest that the level of disclosure on business combination contains information relevant to investors.

VI. CONCLUSIONS

Economic theory in disclosure suggests that managerial disclosure decisions are influenced by the effect disclosure is expected to have on stock price. All models assume simple-to-interpret information that when withheld is assumed to be negative, thus resulting in a decrease in stock price. Early models concluded that this reaction will lead to full disclosure, and later ones qualified this conclusion and showed that in some cases no disclosure of bad news would be optimal.

This study builds on these theoretical foundations and investigates empirically the causes and effects of business combinations disclosure level and whether investors understand the value of differences in disclosure levels. I provide evidence that, after controlling for materiality, disclosure level on business combinations is positively associated with two measures of acquirers' performance: change in ROA one and two years ahead, and a year forward stock return. Further analysis reveals that disclosure level decreases with abnormal goodwill. As abnormal goodwill can be related to both overpayment and artificial overstatement of goodwill resulting in increased post-acquisition earnings per share, both could be responsible for acquirers' tendency to withhold bad news about business combinations.

Investors, however, do not seem to understand the information content in the disclosure level on business combinations. Abnormal disclosure is statistically insignificant in explaining stock returns in the three days following the disclosure on the 10-K. While I cannot completely rule out the possibility that the disclosure score also captures a measure of the "goodness" of the acquirer that is not related to the quality of the business combination, results overall are consistent with acquirers withholding bad news on a significant transaction and investors failing to realize that valuable information is not being disclosed.

APPENDIX A

DISCLOSURE REQUIREMENTS UNDER SFAS NO. 141

General information about the business combination:

- Target's name.
- Percentage of equity interest acquired.
- The purchase price and the type of consideration (cash, stocks, options, etc.), and any contingent payment.
- Brief description of the target and the primary reason for the acquisition, including a description of the factors that contributed to a purchase price that resulted in recognition of goodwill.

Information related to the allocation of the purchase price:

- A condensed balance sheet disclosing the amount assigned to each major caption of asset acquired and liability assumed. Paragraph C2 of SFAS No. 141, which includes an illustration of the disclosure requirements, details the following captions: current assets; property, plant, and equipment; intangible assets; goodwill; total assets acquired; current liabilities; long-term debt; total liabilities assumed; and net assets acquired.
- Any amount allocated to in-process R&D.

Information related to the nature and the amount of intangible assets that were recognized separate from goodwill:

- Finite-life intangible assets (the economic useful life is finite—subject to amortization)—the acquirer should disclose:
    - Total amount assigned.
    - The breakdown of the total amount to the major intangible asset classes.
    - The weighted-average amortization period for each intangible asset class.
    - The overall weighted average amortization period and the amount, in total and by major intangible assets class, of any significant residual value.
- Indefinite-life intangible assets (the economic useful life is not known to be limited by any factor—not subject to amortization)—total amount assigned and the amount assigned to any major intangible asset class.

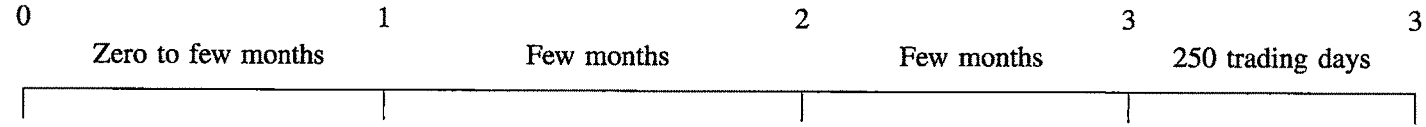
Information related to the goodwill recognized:

- The total amount of goodwill.
- The breakdown of the goodwill recognized to the reporting segments (if the combined entity is required to disclose segment information in accordance with SFAS No. 131).
- The amount of goodwill that is expected to be deductible for tax purposes.

The pro forma information:

- Revenue.
- Income before extraordinary items.
- The cumulative effect of accounting changes.
- Net income and earnings per share.

APPENDIX B
TIMELINE OF A TYPICAL ACQUISITION



Announcement	Consummation	10-Q	10-K	10-K + 250
Press release	For acquisitions in which purchase price is greater than 10 percent of acquirer's total assets, 8-K is submitted with deal terms and deal information	When the acquisition is consummated early in the fiscal year, preliminary unaudited information is provided for material acquisitions	Comprehensive information is submitted as required by SFAS No. 141	

The time frames are only an approximation. An acquisition could be announced and consummated immediately, or it could take a long time to consummate. Announcement and consummation could occur in different fiscal years. This means that the information in the 10-K could, though very rarely, be released more than a year after the announcement.

APPENDIX C

LIST OF THE DATA ITEMS THAT WERE HAND-COLLECTED FROM THE ACQUIRERS' 10-Ks

General Information:

- Target name.
- Acquisition effective date.
- Interest acquired.
- Cash consideration paid.
- Stock consideration paid.
- Total consideration paid.
- Whether the acquirer disclosed the primary reasons for the acquisition.
- Whether the acquirer disclosed the factors that contributed to a purchase price that resulted in recognition of goodwill.

Allocation of the purchase price:

- Cash.
- Accounts receivable.
- Inventory.
- Other current assets.
- Total current assets.
- Property, plant, and equipment.
- In-process research and development (IPRD).
  - Discount rate used in valuation of IPRD.
  - Income statement line item in which IRPD write-offs are aggregated.
  - Finite-life intangible assets.
  - Indefinite-life intangible assets.
  - Goodwill.
  - Deferred tax assets.
  - Other long-term assets.
  - Total assets.
  - Accounts payable.
  - Short-term debt.
  - Other current liabilities.
  - Total current liabilities.
  - Long-term debt.
  - Other long-term liabilities.
  - Deferred tax liabilities.
  - Total long-term liabilities.
  - Total liabilities.
  - Other net assets/liabilities.

Intangible assets:

- Whether the firm disclosed the amount assigned to each major intangible assets class.
  - Marketing intangibles: amount assigned and amortization period.
  - Technology intangibles: amount assigned and amortization period.
  - Contract-based intangibles: amount assigned and amortization period.
  - Customer-related intangibles: amount assigned and amortization period.
  - Total weighted-average amortization period.

Goodwill:

- The portion of goodwill that is expected to be deductible for tax purposes.
- Whether the firm disclosed the assignment of goodwill to the reporting segments.

Pro forma information:

- Pro forma revenue of the combined entity.

Other information collected:

- Whether the firm disclosed if it used the services of an independent appraiser to valuate some of the assets.

Data from Existing Databases

Other data, which completes my sample, are as follows:

SDC/Thomson merger and acquisitions database: From this database I collected the following items:

- Date of announcement of the acquisition.
- Whether the target is publicly traded.
- The target's standard Compustat two-digit SIC code.

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BOOK REVIEWS

Stephen A. Zeff, Editor

Editor's note: Two copies of books for review should be sent to the Book Review Editor: Stephen A. Zeff, Rice University, Jesse H. Jones Graduate School of Management, 6100 Main St., Houston, TX 77005. The policy of *The Accounting Review* is to publish only those reviews solicited by the Book Review Editor. Unsolicited reviews will not be accepted.

RICHARD MATTESSICH, *Two Hundred Years of Accounting Research: An International Survey of Personalities, Ideas and Publications (from the Beginning of the Nineteenth Century to the Beginning of the Twenty-First Century)* (London, U.K.: Routledge, 2008, ISBN 978-0-415-77256-3, pp. xx, 609).

The title of this book suggests a seemingly impossible task. The fact that it has been accomplished by an octogenarian author (with the assistance of co-authors for particular geographical areas) is a remarkable tribute to his enduring intellectual energy. The work is also a tribute to his breadth of scholarship, which crosses linguistic, national, and continental boundaries as well as the less visible but equally effective intellectual boundaries that surround specialties within the accounting literature. The geographical breadth owes a great deal to Mattessich's own lifetime experience, starting in Austria and latterly in Canada: this capability is happily shared by a number of younger continental European scholars who have more recently pursued graduate studies in North America. The ability to transcend intellectual barriers is partly the result of a long and versatile career, ranging from early training as an engineer, with consequent interest in information systems, to the study of Mesopotamian accounting records and many other diverse aspects of accounting. It is doubtful whether this degree of versatility will be found in subsequent generations of accounting scholars, who are likely to be constrained to specialize by the sheer weight of literature (evidenced by the material in this book) and by the need to master specialized techniques. Hence, we can be grateful to the author for what is and is likely to remain a unique contribution to the accounting literature.

The objective of the book is, as its extended title suggests, to provide an international survey of accounting research over the past two centuries. The intended scope is worldwide and, although the treatment is not entirely even or comprehensive (as discussed below), this objective is substantially achieved. Certainly it is difficult to conceive of any other author achieving a wider coverage. Although 15 co-authors are acknowledged for background papers for specific chapters, Richard Mattessich is the sole author of the final version, so that the selection of material and commentaries reflects a consistent perspective and a common set of values. It is therefore not surprising that such topics as accounting history and analytical theory are given more attention than they would receive from some other authors, or that positive accounting theory is given short shrift (p. 4). However, the approach is all-inclusive, and indeed the author himself describes it as "democratic" (p. 1). By this, he means that, despite the reference to "personalities" in the subtitle, he attempts to survey the total body of research literature, rather than concentrate on a few "stars," the latter approach already being catered for in such works as Edwards (1994), and Chatfield and Vangermeersch (1996). Here, personalities are not ignored, but they are not allowed to overshadow the contributions of other contemporaries.

A consequence of this "democratic" approach is that the book contains 220 pages of references, compared to 341 pages of main text and associated footnotes. This weighty list of references is perhaps the most valuable part of the book, because it is a compilation of all of the significant accounting literature that this formidable scholar and his associates were able to discover for the relevant period. The text puts the references in context and provides an overview of the content, but the latter is inevitably superficial: it would be impossible to do full justice to this amount of literature in a single volume. Hence, the use of the book is to guide the reader toward the relevant literature, rather than provide a substitute for reading it. This is extremely valuable for the true scholar and researcher, but discouraging for those who prefer to believe that knowledge is obtainable as a convenience food.

The scope of the book is heavily weighted toward continental Europe (11 of 15 country- or language-specific chapters), perhaps reflecting the author's own origins and certainly aided by his linguistic skills, given the substantial research literature published in German. This is a welcome antidote to the tendency of English-speaking scholars to believe that the only serious research in accounting is published in English. On the other hand, it does result in the whole of the English-speaking world being treated together in two chapters covering the twentieth century, amounting to only 50 pages in all. This group not only includes the pre-eminent weight of research in the United States, but also the distinctive contributions of the British Isles, Canada, Australia, and New Zealand, and the rest of the English-speaking world. Therefore, this area may seem to have been given relatively superficial treatment. Australians in particular may note the absence of such names as Barton, Brownell, Grant, and Wright from the "democratic" assembly. Some of the areas of Europe that are covered may receive relatively more attention than they deserve, notably Russia (one chapter) and Poland and the Ukraine (one joint chapter), whose evolution in accounting research was inhibited by Communist governments for significant periods in the twentieth century.

However, it is the world beyond Europe and the English-speaking world that is given minimal treatment, apart from a useful chapter on Japan and a chapter on Argentina, which contains relatively little about research (surveying all literature, including textbooks and describing professional arrangements in some detail) and which surprisingly devotes only slight attention to inflation accounting, an area in which Argentina has led international practice. Apart from these, the rest of the world is alluded to, rather than covered, in a six-page chapter on "other countries." This covers the rest of Latin America, Africa, the Middle East, and the Far East. It may be that there is little research to record in these countries, but this seems to be unlikely in view of their distinctive experience of accounting. For example, inflation accounting was practiced in several Latin American countries, notably Brazil, Chile, and Mexico in addition to Argentina. Equally, the Muslim countries have the challenges of Islamic accounting, which is a topic of serious research and is generating a growing literature. Thus, the reader, while being impressed by the breadth of scholarship embodied in the book, should not harbor the false hope that it provides universal coverage: that would be an unrealistic and unreasonable expectation with which to burden the author.

The plan of the book is simple. An introductory chapter sets forth the author's aims and methods and provides a brief overview of each of the subsequent chapters. The second chapter covers the nineteenth century accounting literature for all of the countries surveyed. This is followed by the 16 geographically oriented chapters covering the twentieth century. Finally, Chapter 19 is entitled "The information economic perspective and the future of accounting." The theme of this chapter is that the information economics perspective, as embodied in the recent work of Christensen and Demski (2003) and Christensen and Feltham (2003, 2005), is the most promising paradigm in current accounting research. This paradigm certainly has made significant contributions and promises more, but other paradigms also have merit and potential value, given the eclectic nature of accounting as an activity and a field for research. It is therefore a little disappointing to conclude with a chapter that seems to foresee future closure in the development of accounting research, rather than a continuation of fruitful competition between different paradigms. The author's concluding vision of "The coming of age of the information perspective, and the claim of its potential for a general accounting theory" (p. 321) sits uneasily with his previously expressed view of accounting as an applied discipline ("such thoroughly normative disciplines as engineering, medicine, law and accounting," p. 193) rather than a pure science. Applied disciplines, in their very nature, do not have overarching general theories such as the physicists' string theory, to which the information perspective is compared on page 322.

In an undertaking of this scale, there are bound to be some errors and omissions. Omissions are inevitable in a single volume work with such wide scope and are a matter of judgment. The book gives a good introduction to the relevant literature, which should enable the assiduous researcher to find that which is left out. In regard to errors, the reviewer noted a number of typographical and spelling errors but none that was likely to mislead seriously, and the number was low in relation to the volume of the work. In regard to errors of fact rather than presentation, it would require rare scholarship to detect these across the whole range of the book. Within the reviewer's narrow compass (English-speaking, mainly financial accounting) there were few such errors, an example being the citation of W. T. Baxter's textbook, *Income Tax for Professional Students* (1937), as a work of accounting history (p. 178), rather than the same author's *The House of Hancock* (1945), which was. However, such an error is likely to inconvenience the reader rather than mislead.

Of greater interest is whether the author's account of the literature gives a balanced view which is as complete as could be expected in a limited space. The reviewer attempted to assess this in the field of measurement. In this area, the book provides an intriguing introduction to the literature of the first half of the twentieth century, particularly the continental European literature. The great personalities, such as the Germans Schmidt and Schmalenbach, the Dutch Limperg, and the Italian Zappa are given their due, together with a host of less famous writers, among whom is the Finn, Kovero, who appears to have anticipated much of the content of the later replacement cost writers, although assessing his contribution requires accessing his work in German. The apparent tension between Limperg and Schmidt is well discussed. The treatment of the American writer, J. B. Canning, is less satisfactory, because his work is characterized as being solely concerned with net present values (p. 172). This ignores his concept of "opportunity differences," which were close to Bonbright's later concept of "deprival value" and to Limperg's "replacement value." Canning's ideas were later adapted to derive deprival value principles by the Australian author F. K. Wright (1977), who is not mentioned in the book.

Another author of the first part of the twentieth century who is perhaps not fully acknowledged is H. W. Sweeney, the American author of *Stabilized Accounting* (1936). Sweeney was as an advocate of general price-level stabilization of historical cost but preferred general price-level stabilization of replacement cost accounts, giving it less emphasis merely because he thought that it would not be acceptable in practice (which was borne out much later by the experience of the Financial Accounting Standards Board in the reaction to SFAS 33, issued in 1979). Chapter 3 of *Stabilized Accounting* develops a replacement cost stabilization system that anticipates the preferred model of Edwards and Bell (1961). As Mattessich states (p. 53), Edwards and Bell developed the model further and gave it a stronger theoretical underpinning, but Sweeney deserves greater credit for his pioneering integration of current replacement costs with a general price-level adjustment than is implied by the terse statement (p. 172) that Sweeney's theory "does consider an additional adjustment for replacement values."

In the field of pure income measurement, the most regrettable omission is the work of Parker and Harcourt (1969). This made the theoretical work of many leading economists available to accountants, and its original introduction had a significant impact on the academic debate on income measurement and the policy debate on inflation accounting. This omission may indicate the author's North American rather than British perspective on the literature of the English-speaking world. This may also contribute to a second omission, the failure to mention the outstanding theoretical paper by Kay (1976) on the relationship between the accounting rate of return and the economist's internal rate of return (subsequently extended to an analysis of deprival value in Edwards et al. [1987]), although this may also be due to its publication in an economics journal. The subsequent debate on the same subject initiated by Fisher and McGowan (1983) is also omitted, presumably because it appeared in *The American Economic Review* rather than *The Accounting Review* and has therefore achieved little impact in accounting journals. This is understandable in today's specialized world, but it demonstrates the cost of specialization. It is inconceivable that earlier distinguished accounting authors who came from an economics background, such as Canning or Edwards and Bell, would not have followed the contents of *The American Economic Review* and absorbed any relevant parts into the accounting literature. However, it must be admitted that Mattessich's own favored area for future developments in accounting research, the information economics perspective, does draw heavily on economics, so that cross-fertilization between disciplines, although becoming more difficult and specialized, is not at an end.

Thus, consideration of this particular area of research suggests that the coverage is not comprehensive and that it is possible to disagree with the characterizations of the contributions of some authors. Both of these are inevitable consequences of the constraints of the task, alluded to earlier. It is not possible to capture the fruits of two centuries of research comprehensively in a single volume, or to provide an uncontestable account of a particular contribution within a single sentence or paragraph, which is all that a condensed work of this type will typically afford. It is important to be aware of these limitations, but they should not be allowed to hide the real value of this book.

What, then, is the real value of the book? First and foremost, it is a unique means of accessing the richness and diversity of the accounting literature, the first step on a long journey through the original material for those who wish to gain a proper appreciation of what has been achieved by two centuries of scholarly endeavor. Second, it provides an overview of what has been achieved, which gives us the opportunity to see the view from the mountain top. As with all such views, the detail may be lacking and sometimes obscured, but the overall view is impressive.

The first impression is of the sheer *scale* of what is on display, together with what is not on display but will be revealed by delving further into the literature. It is likely that few accountants, even those who are academics, appreciate this, yet in many cases they are dealing with issues that have been dealt with before and have probably inherited attitudes and beliefs from the earlier literature. This suggests that the study of the literature of the past deserves more attention than it currently receives. Keynes (1936, 383) made an apt comment on the same issue in relation to economics: "Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist."

The second impression is of immense *variety*. This has three dimensions: subject matter, methodology, and geography. In regard to subject matter, there are not only the traditional broad classifications of management accounting and financial accounting, and the many subdivisions within them, but also the wider issues of social accounting, as embodied in the continental European charts of accounts and the French *plan comptable*. These systems were intended to be universal, providing information that would meet the needs of management, providers of finance, and national governments, so that they spanned the traditional divisions. The recent development of

XBRL (surprisingly not mentioned in the book) may be seen as a present-day counterpart to these systems, although the issue as to whether the same basic information can serve all needs is still open.

In regard to the variety of methodology, this has grown rather than narrowed over the past two centuries. This applies both to broad paradigms, such as that of the critical-interpretive school (pp. 204–206) and to more specific models and techniques, such as the econometric models used in market-based accounting research (p. 198). To some extent, methodology transcends the traditional functional boundaries: the analytical models of the information economics approach favored by Mattessich can, for example, be applied in both management accounting and financial accounting, as can a behavioral approach. However, the emergence of new methodologies does raise communication barriers between researchers who do not share the same technical knowledge. The increasing variety of methodologies that is employed in accounting research seems to confirm the author's view (p. 193) that accounting is an applied discipline rather than a pure science.

The geographical variety of accounting and accounting research reflects the different institutional and historical experience of different countries, such as the European experience of hyper-inflation following the First World War. Nevertheless, it is also clear that these pressures crossed national boundaries, and so did scholars and their books. For example, Henry Sweeney's pioneering American work on stabilized accounting drew heavily on the continental European literature. The globalization of the world economy might be expected to moderate international variations and make accounting research, like accounting standard setting, an international enterprise. The book contains much evidence that supports the view that this is already happening. Thus, the future variety of accounting research is likely to be sustained relatively more by methodological than by geographical differences.

In summary, Mattessich's book is a welcome addition to the literature, stimulating and provocative to read. It provides a complement to a remarkable reference work by another of the outstanding accounting theorists of the twentieth century, Raymond Chambers' *Accounting Thesaurus* (1994). The latter is a very different work: pithy quotations from original sources arranged topically, from a longer historical period but confined to the literature in English. Nevertheless, Chambers' original sources added to Mattessich's necessarily brief contextual introductions would make fine companions for an accounting researcher stranded on the proverbial desert island. Add Chatfield and Vangermeersch's encyclopedia (1996), and the result would be an educational course that perhaps all aspiring accounting researchers should undertake.

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JEFFREY UNERMAN, JAMES GUTHRIE, and LUDMILA STRIUKOVA, *UK Reporting of Intellectual Capital* (London, U.K.: Centre for Business Performance, The Institute of Chartered Accountants in England and Wales, 2007, ISBN 978–1–84152–507–5, pp. 68).

In an interview in the first issue of the *Journal of Intellectual Capital* (Chatzkel 2000, 102), Hubert Saint-Onge distinguishes between what he sees as "intellectual capital" and "knowledge, or knowledge strategy":

> the intellectual capital framework is a representation of the "stocks" of intangible assets, while knowledge is the electrical current that runs between these assets to grow the human, structural and cultural capital.

While this distinction highlights the difficulties of definition with respect to intellectual capital (IC), it also serves as a useful device to assess the contribution of this report entitled *UK Reporting of Intellectual Capital.* This report, whose authors include leading academicians in both IC and qualitative research methods, aims to contribute to the "analysis and understanding of existing [IC reporting] practices, and the key factors which appear to drive such practices" (p. 17). It contributes to the "stock" of knowledge, using content analysis to identify, record, and analyze all of the IC disclosures (ICDs) in a broad range of corporate reports produced by a sample of 15 companies in a variety of sectors. It adds to the "electrical current" that grows our understanding of the motivations of preparers of IC reports (ICR) through interviews with one or more senior financial executives from each of the sample companies "in order to ascertain the perceptions of the preparers of corporate reports regarding a variety of issues connected with ICR" (p. 25).

This is not an analysis of a large dataset, and its generalizability is consequently limited. However, this research has value because it examines ICDs in a wide range of disclosure mechanisms. This is particularly informative in the case of ICDs which, as the report finds, often tend to be disclosed in places other than the annual report. The research examines the context as well as the content of ICD by exploring the dynamics of disclosure through interviews and other means. This sheds light not only on the outputs of ICR, but also on the underexplored underbelly of disclosure policies and processes within the firm.

Consistent with the wide perspective adopted in the early part of the research, the interviews found that preparers of ICR information believed that ICDs in annual reports "had little, if any, information content" and that "ICR strategies incorporated the use of a variety of media" (p. 54). The "overwhelming view" of the interviewees "was that communication of information about IC drivers through the interactive medium of face-to-face meetings was much more effective than communication through written documents (p. 49). This suggests that the assessment of the "information value" of ICD and other disclosures requires the consideration of a broader data set than obtained from annual reports alone.

The study of IC has emerged as a growing area of research in accounting and more widely, as summarized, for example, by Petty and Guthrie (2000), Guthrie et al. (2001), Marr and Chatzkel (2004), and Abeysekera (2006). These authors persistently point to the difficulties in reaching a shared definition of IC: "as a concept [IC] is often poorly defined[;] we therefore advise that researchers and practitioners clearly define the term at the outset whenever the term is used" (Marr and Chatzkel 2004, 226). This ICAEW report follows this advice by defining the adopted definition of IC at the outset (p. 15): this definition is quite broad and includes internal/structural capital, external/relational capital, and employee competencies/human capital.

Yet definitional problems permeate the research in this report. This is particularly acute in the interviews where, the authors themselves admit, there is an absence of shared meaning with regard to IC. Furthermore, the authors expect that sectors comprising the "knowledge economy" are more likely to disclose IC (p. 34) and express surprise (p. 36) that the ICDs were found most frequently in the retail sector. However, given that the definition of IC used in the research includes external/relational capital, such as customers and distribution channels, and that these are the "most reported," one would expect that these would be key value drivers of the retail sector and, consequently, have a high propensity for disclosure.

With respect to method and the "electrical current" that runs through the research, I would like to have seen clearer links between the findings of the content analysis of ICD and the processes of such disclosures explored in the interviews. Given the relatively small sample size—15 reporting entities—there is potential in the approach adopted for a deeper understanding of the processes of ICD. The content analysis does not establish a clear thread by which the processes of ICD for each company can be further and more specifically explored in the interviews as a piece of the same fabric. An understanding of the dynamics of disclosure would be enhanced if the content of the ICDs for each of the 15 companies identified in the first part of the research was then more clearly traceable for the same companies in the interviews.

While ICD research has increased substantially in the last decade—with a journal now dedicated to the area—we still have much to learn about the content and the context of ICD. Several authors (e.g., Lev 2003; Chatzkel 2004) have suggested that research and practice with regard to IC is "at a crossroads." The qualitative research detailed here—content analysis and interviews—is painstaking and time-consuming. This report therefore represents a necessary reconnaissance of a particular, potentially fruitful pathway for such research. We look forward to further forays in this direction by these authors.

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EDITORIAL POLICY AND STYLE INFORMATION

EDITORIAL POLICY

According to the policies set by the Publications Committee (which were endorsed by the Executive Committee and were published in the *Accounting Education News*, June 1987), *The Accounting Review* "should be viewed as the premier journal for publishing articles reporting the results of accounting research and explaining and illustrating related research methodology. The scope of acceptable articles should embrace any research methodology and any accounting-related subject, as long as the articles meet the standards established for publication in the journal ... No special sections should be necessary. The primary, but not exclusive, audience should be—as it is now—academicians, graduate students, and others interested in accounting research."

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The efficiency and effectiveness of the editorial review process is critically dependent upon the actions of both authors submitting papers and the reviewers. Authors accept the responsibility of preparing research papers at a level suitable for evaluation by independent reviewers. Such preparation, therefore, should include subjecting the manuscript to critique by colleagues and others and revising it accordingly prior to submission. The review process is not to be used as a means of obtaining feedback at early stages of developing the research.

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Pagination: All pages, including tables, appendices and references, should be serially numbered. Major sections should be numbered in Roman numerals. Subsections should not be numbered.

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111 THE UNIVERSITY OF IOWA, Department of Accounting, Tippie College of Business, University of Iowa, Iowa City, Iowa, invites applicants for a Lecturer appointment(s) beginning fall of 2009. Desired qualifications include a Ph.D. and teaching experience for a peer institution. Minimum qualifications are a B.A. in Business Administration in Accounting and a Master of Arts Degree. We will consider candidates at all ranks. We will also consider a one- or two-year visiting appointment if we are unable to fill the anticipated position(s). We offer a competitive compensation package. We will screen applicants at all ranks on an ongoing basis. To apply, please log on to our website: https://www.biz.uiowa.edu/recruiting/accounting, where you will be asked to upload a resume, evidence of teaching capabilities (if available), and provide the names for at least three letters of recommendation. Please indicate what position you are applying for. The University of Iowa is an Affirmative Action/Equal Opportunity Employer. Women, minorities, and individuals with disabilities are encouraged to apply.

112 WIDENER UNIVERSITY, School of Business Administration, which is accredited by AACSB International, invites applications for a tenure-track position in accounting at the rank of Assistant Professor, starting in the fall of 2009. Candidates' primary teaching and research expertise should be in the area of auditing and forensic accounting. Interest and experience in accounting information systems are also desirable. Candidates will be expected to teach external and internal auditing and financial fraud examination at the undergraduate and graduate level. Candidates must hold a Ph.D. or D.B.A. in Accounting from an AACSB-accredited institute or expect to complete the degree by the fall 2009. Professional certification is also a plus. Candidates must be committed to excellence in teaching and research/scholarly activity and must be excited about the opportunity to develop curriculum and interact with the business community. Widener University is a private, metropolitan university located near urban, suburban, and rural regions, facilitating a variety of interests and lifestyles. The School of Business Administration (SBA) is one of eight schools/colleges within the University and offers undergraduate majors in Accounting, Economics, Management and International Business, and graduate degrees in Business Administration, Information Systems, Human Resources and Organizational Leadership, and Taxation and Financial Planning. The SBA has 34 full-time faculty servicing over 500 undergraduate and over 200 graduate students. Widener is one of five U.S. universities with an SAP, IDS Scheer Business Process Innovation Center of Excellence. Please send a letter of application, *curriculum vitae*, three reference letters, official transcripts, and teaching evaluations (if available) to: Dr. James Tucker, Search Committee Chair, School of Business Administration, Widener University, One University Place, Chester, PA 19013-5792; Phone: 610-499-4611; Email: jjtucker@mail.widener.edu. The Search Committee will begin reviewing applications in November and will continue until the position is filled. To find out more about the University, please visit our website at: http://www.widener.edu. Widener University is an Equal Opportunity Employer that encourages excellence through diversity. Women and minority candidates are encouraged to apply.

113 TEXAS CHRISTIAN UNIVERSITY M. J. NEELEY, School of Business, Chair, Department of Accounting, invites applications and nominations for the position of Chair of the Department of Accounting to begin in August 2009. We seek candidates with demonstrated excellence in teaching and research and a cumulative record that would warrant a faculty appointment at the rank of Full Professor. Applicants at the Associate or Full Professor level will be considered. Administrative experience is desirable but not required. The Department Chair will provide academic leadership in supporting faculty development and program growth, strengthen relationships with the Dallas-Fort Worth (DFW) accounting community and TCU alumni, and have administrative responsibility for the department. The Neeley School offers M.B.A., Master of Accounting (M.Acc.), and B.B.A. degree programs. Our programs have been accredited by AACSB since 1963 and the Department of Accounting since 1994. The Neeley School has as excellent environment for faculty with nationally competitive salary and benefits, excellent research support, attractive teaching loads, low student-to-faculty ratio, and superior physical facilities. The business undergraduate enrollment of 1,600 students and the graduate enrollment of 350 students are taught by 69 full-time tenure-track faculty, including 15 in the Department of Accounting. For further information, go to: http://www.neeley.tcu.edu. Applications should include a cover letter, *curriculum vitae*, and the names and contact information for at least three references, sent to: Mary Harris Stanford, Professor of Accounting, Texas Christian University, Neeley School of Business, TCU Box 298530, Fort Worth, TX 76129; Email: m.stanford@tcu.edu (electronic applications preferred). TCU is an EEO/AA employer. Applications by women and minority candidates are especially encouraged.

114 FLORIDA INTERNATIONAL UNIVERSITY, School of Accounting invites applications for instructors, clinical, or tenure-track positions in all areas of accounting and for instructors of business law beginning fall 2009. Doctorate or L.L.M. (Taxation) required for accounting positions; J.D. required for business law positions. Preference may be given to applicants with publications in their respective fields. Expectations include strong commitment to excellence in graduate and undergraduate teaching, research. and service. Duties may include teaching in weekend and overseas programs. Applications from minority candidates are encouraged. The School of Accounting is separately accredited by AACSB and offers B.Acc., M.Acc., M.S.T. and Ph.D. programs. FIU is identified in the Carnegie classification as a Research University/High Research Activity institution with enrollments in excess of 38,000 students. FIU is a growing public university that admitted its first class in 1972. It has a diverse student body including both full-time residential students as well as commuters. FIU's modern picturesque campus with tropical flora is located in the suburbs of Miami. To apply, send a *vita* and names of five references to: Ana Estevill, Florida International University, School of Accounting, 11200 SW 8th St., RB 210, University Park, Miami, FL 33199: Email: estevill@fiu.edu. FIU is an Equal Opportunity Employer.

115 WICHITA STATE UNIVERSITY invites applications for a tenure-eligible faculty position beginning August 2009 at the Assistant or Associate Professor rank. Required: Ph.D./D.B.A. in Accounting (ABD considered), plus a significant research record for Associate Professor status; academically qualified for AACSB; teaching and research interests in accounting; commitment to quality teaching and research; commitment to professional community interaction; and commitment to diversity. Preferred: accounting experience; U.S. professional certification; teaching and research interests in any accounting area meeting the needs of the School of Accountancy. Review of applications begins December 5, 2008, and continues until the position is filled. The position is contingent upon funding. Employment offers are contingent upon completing a satisfactory criminal background check required by Board of Regents policy. Apply with *vitae* to: jeffrey.bryant@wichita.edu, or at: https://www.hrepartners.com/jobs/PositionsListing.cfm?PartnerCode=WP, or send to: Jeff Bryant, School of Accountancy, Wichita State University, 1845 Fairmount, Wichita, KS 67260-0087. WSU is an EEO/AA employer.

116 PEACE COLLEGE Business Administration Program is searching for a full-time faculty member as an Assistant Professor or Instructor in Accounting and Finance, with a starting date of August 1, 2009. Tenure-track or continuing appointment available depending on degree. Responsibilities include teaching accounting and finance in the business administration program designed for undergraduate students. Requirements: Ph.D. in Finance or Accounting, or related field in business preferred. M.A. or M.B.A. candidates will also be considered. Business experience and some background in finance and accounting are desirable. Please submit the following application materials: copy of *curriculum vitae*; copies of unofficial transcripts; contact information of three current professional references; summary/copies of past teaching evaluations (if available). Please submit all information to: humanresources@peace.edu; or: Human Resources, Peace College, 15 E. Peace Street, Raleigh, NC 27604: Fax 919-508-2767.

117 DePAUL UNIVERSITY, School of Accountancy and MIS invites applications for a tenure-track position at the Assistant, Associate, or Full Professor level starting in fall 2009. Candidates must hold a doctoral degree in Accounting from an AACSB-accredited school. ABDs will be considered if completion of dissertation is anticipated by starting date. Candidates should demonstrate potential for success in scholarly research and excellence in teaching. Qualified individuals in all specialty areas of accounting will be considered. Salary and benefits are competitive with AACSB schools. Review of applications will begin immediately and will continue until the position is filled. Interested applicants should submit *curriculum vita*, samples of scholarly work, teaching evaluations, and two letters of reference to: Phillip Chomiak, Coordinator of Faculty and Curriculum School of Accountancy and MIS, DePaul University, One East Jackson Blvd, Chicago, IL 60604; Email: pchomiak@depaul.edu. Information about DePaul University can be found at: http://www.depaul.edu. Information about the School of Accountancy and MIS can be found at: http://accountancy.depaul.edu.

118 THE UNIVERSITY OF TEXAS AT ARLINGTON, Department of Accounting, invites applications for tenure-track positions at Assistant or Associate level in all areas of accounting to begin August 2009. Applicants must have an appropriate doctoral degree at the time of joining the faculty. We will also consider ABDs close to completion. All applicants are expected to have a commitment to quality research demonstrated by publishing in nationally recognized "A" journals, teaching excellence, and academic/professional service. All areas of expertise will be considered. The College of Business and Department of Accounting are both AACSB-accredited. Review of applications will begin immediately, and continue until the position is filled. A complete resume, working paper, and three reference letters should be sent to: The University of Texas at Arlington, Department of Accounting, Jennifer Ho, Search Committee Chair, Box 19468, Arlington, TX 76019. Website: http://www.uta.edu. This is a security-sensitive position, and a criminal background check will be conducted on all finalists. The University of Texas at Arlington is an Equal Opportunity and Affirmative Action Employer.

119 UNIVERSITY OF MICHIGAN, Ross School of Business has tenure-track positions available in Accounting starting in the 2009 academic year. Candidates with research and teaching interests in all areas of accounting will be considered. Faculty positions at all ranks are available. The application should include a research paper, which may be based on the candidate's dissertation, evidence of teaching experience (if any), and a *curriculum vitae* that includes three references. Applications should be sent by mail only to: Ms. Connie Allen, Stephen M. Ross School of Business, University of Michigan, 701 Tappan Street, Ann Arbor, MI 48109-1234. The University of Michigan offers competitive salary and fringe benefits and is an Affirmative Action/Non-Discriminatory Employer.

120 UNIVERSITY OF SOUTHERN MISSISSIPPI, School of Accountancy and Information Systems invites applications for a tenure-track position in accounting beginning August 2009. The position is for the Gulf Coast campus. Associate and Assistant ranks will be considered. To ensure full consideration please apply no later than December 1, 2008. Please apply at: https://jobs.usm.edu. Applications will be accepted until the position is filled. Please indicate Associate or Assistant when making application. Duties and responsibilities include but are not limited to the following: the candidate for Assistant Professor must demonstrate strong evidence or promise of scholarly research and effective teaching. The candidate for Associate Professor must demonstrate an established record of scholarly activity. Preferred qualifications are previous publications and/or teaching experience. Minimum qualifications are Ph.D. in Accounting by the time of appointment, or ABD with defense date within academic year. Applicants must demonstrate evidence of ability to engage in effective research and teaching abilities.

121 TOWSON UNIVERSITY has three tenure-track positions in accounting available at the Assistant Professor level for fall 2009. All areas of specialization will be considered. Applicants should possess a Ph.D./D.B.A. in accounting, or a Ph.D./D.B.A. in a related area with professional certification in accounting. Applicants must also provide evidence of teaching effectiveness and research productivity or potential. ABDs will be considered if completion is expected within the first year of appointment. Teaching load is nine credit hours per semester. Review of applications will begin immediately, and will continue until the positions are filled. Towson University is AACSB-accredited in both business and accounting, and jointly offers M.B.A. and M.S. programs with the University of Baltimore. Please submit an application, *vitae*, official transcripts, and three letters of reference to: Dr. Andrew Schiff, Recruitment Chair, Towson University, Department of Accounting, Stephens Hall, Room 102, 8000 York Road, Towson, MD 21252-0001; Email: aschiff@towson.edu.

122 KDI School of Public Policy and Management has job openings for tenure-track in the field of accounting for the academic year of 2009. Applicants must have a Ph.D. or should be expecting to receive one by September 2009, in the field of accounting. Review of applications begins December 2008 and will continue until positions are filled. Application including a *cv*, a cover letter, and research papers and three letters of recommendation should be sent by December 20, 2008 to ensure full consideration to: Haewon Han, Planning Division, KDI School of Public Policy and Management, 87 Hoegiro, Dongdaemun-gu, Seoul, 130-868 Korea; Email: hwhan@kdischool.ac.kr; Phone: 82-2-3299-1268; Fax: 82-2-3299-1234. Visit us at: http://www.kdischool.ac.kr.

123 AMERICAN UNIVERSITY OF BEIRUT, Suliman S. Olayan School of Business (OSB) is seeking to fill academic positions at the ranks of Assistant Professor/Associate Professor/Full Professor in Accounting. Applicants should have a Ph.D. or a D.B.A. Those applying for Assistant Professorships who have a recent doctorate should show a strong research potential. Applicants for Associate and Full Professorships should have a record of commensurate research achievement. Successful candidates will be expected to conduct research at the forefront of their field and to teach at the undergraduate, the M.B.A. and the Executive M.B.A. levels. Information on AUB, OSB, and further particulars of the posts are available at: http://sb.aub.edu.lb/faculty/facultyopenings.asp. Applications should be submitted, preferably by email, to: Mrs. Hala Azar, Assistant to the Dean, Suliman S. Olayan School of Business, American University of Beirut, PO Box 11-0-236, Beirut-Lebanon: Fax: 961-1-750214; Email: Ha01@aub.edu.lb, and should consist of a letter of application, a current *cv*, sample copies of publications, and three letters of recommendation. Applications should be received by December 15, 2008 for appointment for the spring of 2009 and by February 15, 2009 for appointment for the fall of the 2009–2010 academic year. However, the search will continue until all vacancies are filled. AUB is an Equal Opportunity Employer

124 CASE WESTERN RESERVE UNIVERSITY, Weatherhead School of Management, invites applications for Associate or Full Professor of Accountancy for fall 2009. Requirements include a doctorate in accountancy and a very strong record of research. Evidence of quality teaching is also necessary. Although candidates with a specialization in any accountancy area are invited to apply, we prefer those interested in the managerial, financial, and auditing areas. Professional certification (e.g., CPA, CMA) and relevant experience are required. The Department offers a B.S. in Accountancy, a Master of Accountancy, and a Ph.D. Department faculty is also heavily involved in the M.B.A. program. All programs are AACSB-accredited. Additional information can be found at http://weatherhead.case.edu/acct. Send *curriculum vita* and other materials to Elaine Iannicelli at: eri@case.edu by April 2009. In employment, as in education, Case Western Reserve University is committed to Equal Opportunity and Diversity. Women and minority applicants are especially welcome.

125 LINGNAN UNIVERSITY is a distinctive liberal arts institution in the Hong Kong Special Administrative Region. The University now invites applications for the positions of Professor/Associate Professor/Assistant Professor in the Department of Accountancy for the academic year 2009–2010 (Post Ref: 08/145/AAA). The appointee should be able to teach in at least two of the following areas: Financial Accounting, Auditing, Accounting Information Systems, and Managerial Accounting. CPA qualification and demonstrated research strength are definite advantages. Applicants should have a Ph.D. degree in a relevant discipline. For appointment as an Associate Professor, applicants should have at least five years of relevant experience and a track record in research and scholarly activities. For appointment as a Professor, applicants should have substantial research and teaching experience with significant scholarly publications and academic achievements. For more details of the post and the application procedures, please refer to: http://www.ln.edu.hk/hr/employOpp.htm.

126 WASHINGTON UNIVERSITY IN ST. LOUIS, Olin Business School is seeking faculty to teach courses in Accounting and/or related areas, conduct research, publish in peer-reviewed journals, advise students, and participate in faculty meetings. Information about the school and current faculty can be found at: http://www.olin.wustl.edu/. Candidates for Assistant Professor should have their doctoral dissertation completed or near completion. Candidates for Associate and Full Professor should have a substantial record of scholarship and an international reputation. Applications are being accepted through the Washington University in St. Louis Faculty Recruitment link. Please visit our website: http://www.wustlcareers.com and click on the Search Posting/Apply tab on the left panel; then use the search criteria to review complete descriptions of positions and guidelines for applying. Application deadline: February 15, 2009. Olin Business School is an Affirmative Action/Equal Opportunity Employer and encourages women, minorities, dual career couples, and persons with disabilities to apply.

127 UNIVERSITY OF WATERLOO invites applications for tenured or tenure-track positions in Accounting beginning 2009, especially from applicants with teaching interests in assurance or financial reporting. Rank and field are open. Candidates should have a Ph.D. or expect to complete one in 2009, should demonstrate high-quality research and teaching or the potential for both, and should have interest in contributing to our Ph.D. program. For details about our faculty and programs, please visit: http://accounting.uwaterloo.ca/. To apply, please send a *curriculum vitae* and research sample electronically. In addition, three referees should send letters directly to: heidi@uwaterloo.ca. Contact: The Director, c/o Heidi Campbell, School of Accounting and Finance, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada. The University of Waterloo encourages applications from all qualified individuals, including women, members of visible minorities, native peoples and persons with disabilities. Canadian citizens and permanent residents receive priority. Review of applications will continue until all the positions are filled.

128 INDIANA UNIVERSITY NORTHWEST invites applications for a full-time ten-month academic position as Assistant/Associate Professor of Accounting. The School of Business programs are fully accredited by AACSB. It offers the Bachelor of Science degree in Business with concentrations in Business Administration and Financial Information Systems and a Master of Business Administration degree. Qualifications: Responsibilities: nine-hour teaching load in accounting and related fields, research and service activities appropriate to the field and rank. The candidate must have an earned doctorate in field or a related field from an accredited institution. The position is available August 2009. Visit http://www.iun.edu/~busnw/for more information. Send resume and cover letter to: David Strupeck, Search Chair, School of Business and Economics, IU Northwest, 3400 Broadway, Gary, IN 46408. The formal review of candidates' materials will begin immediately with applications received by January 31, 2009 receiving full consideration.

129 WESTERN NEW ENGLAND COLLEGE invites applications for a tenure-track Assistant/Associate Professor accounting position to begin August 2009. Candidates are expected to hold a doctorate in accounting or anticipate having completed all degree requirements by the starting date. The successful candidate will demonstrate a strong commitment to teaching financial reporting, cost accounting, and/or auditing in the undergraduate and graduate programs and to scholarly research. Western New England College is a private, independent, coeducational institution founded in 1919. Located on an attractive 215-acre suburban campus in Springfield, Massachusetts, the College serves approximately 4,000 students, including 2,500 full-time undergraduate students, on its main campus and at four sites throughout the Commonwealth. Undergraduate, graduate, and professional programs are offered through the College's Schools of Arts and Sciences, Business, Engineering, Law, and Pharmacy (opening in 2011 pending approval). Send *vita*, teaching evaluations, research manuscript, and reference information to: Dr. Julie Siciliano, Dean, School of Business, Western New England College, 1215 Wilbraham Road, Springfield, MA 01119. Electronic submissions are encouraged and should be sent to: acctprof@wnec.edu. Western New England College is an Equal Opportunity Employer.

130 WESTERN NEW ENGLAND COLLEGE invites applications for a tenure-track Assistant/Associate Professor accounting position to begin August 2009. Candidates are expected to hold a doctorate in accounting or anticipate having completed all degree requirements by the starting date. The successful candidate will demonstrate a strong commitment to teaching accounting information systems and fraud/forensic accounting in the undergraduate and graduate programs, and to scholarly research. Western New England College is a private, independent, coeducational institution founded in 1919. Located on an attractive 215-acre suburban campus in Springfield, Massachusetts, the College serves approximately 4,000 students, including 2,500 full-time undergraduate students, on its main campus and at four sites throughout the Commonwealth. Undergraduate, graduate, and professional programs are offered through the College's Schools of Arts and Sciences, Business, Engineering, Law, and Pharmacy (opening in 2011 pending approval). Send *vita*, teaching evaluations, research manuscript, and reference information to: Dr. Julie Siciliano, Dean, School of Business, Western New England College, 1215 Wilbraham Road, Springfield, MA 01119. Electronic submissions are encouraged and should be sent to: acctprof@wnec.edu. Western New England College is an Equal Opportunity Employer.

131 RHODES COLLEGE, Department of Economics and Business, seeks a tenure-track Assistant Professor of Accounting beginning fall 2009. Accounting courses are offered for both our undergraduate business major and our M.S. in Accounting program. A Ph.D., a CPA certificate, and credentials appropriate for a department that values both teaching excellence and research production are required. We seek an individual with broad teaching interests and experience who appreciates the opportunities of working in a liberal arts setting. Our ideal candidate will nourish and support the academic growth of students in a collaborative atmosphere of advising, mentoring and shared learning. We encourage applications from candidates interested in helping us achieve the Rhodes Vision. Submit letter of application, *vita*, three letters of recommendation, evidence of teaching excellence, graduate transcript, and writing sample of research to: Dr. Pamela Church, Rhodes College, 2000 North Parkway, Memphis, TN 38112. Review of completed applications will begin immediately and continue until the position is filled. Founded in 1848, Rhodes College is a highly selective, private, coeducational, residential college located in Memphis, Tennessee. We are an Equal Opportunity Employer committed to diversity in the workforce.

132 CALIFORNIA STATE UNIVERSITY, EAST BAY, Department Chair for Accounting and Finance full-time tenure-track, OAA Position No. 09-10 ACCT-DEPTCHAIR-TT. The Department of Accounting and Finance offers undergraduate and graduate coursework in Accounting, Finance, Real Estate, and Taxation. Professional experience is a plus. Working professionals with the appropriate qualifications are encouraged to apply. The candidate must have a record demonstrating teaching excellence and quality publications, *and* should possess administrative skills and strong leadership capabilities. Date of appointment: Summer or Fall Quarter 2009. Review of applications will begin November 1, 2008 and will continue until the position is filled. Please submit a letter of application; a complete and current *vita*; graduate transcripts; student evaluations; copies of major publications; and three letters of recommendation to: Dr. Terri Swartz, Dean College of Business and Economics California State University, East Bay, 25800 Carlos Bee Boulevard, Hayward, CA 94542; Phone: (510) 885-3291; Fax: (510) 885-4352; Email: Kathy.dulkie@csueastbay.edu. California State University, East Bay is an Equal Opportunity Employer and hires only individuals lawfully authorized to work in the United States.

133 UNIVERSITY OF UTAH, School of Accounting invites applications for new tenure-track faculty positions in Accounting at all ranks in any area of specialization beginning fall 2009, pending funding and University approval. Applicants should possess a doctorate or be close to completion. The School of Accounting and the David Eccles School of Business are accredited by the AACSB. Send application by November 15, 2008, including dissertation proposal or working paper, *vita*, and three letters of reference to: Robert Allen, Director, School of Accounting, 1645 E Campus Center Dr., Room 108, University of Utah, Salt Lake City, Utah 84112. Late applications accepted until position is filled. The University of Utah is an Equal Opportunity, Affirmative Action Employer, encourages applications from women and minorities, and provides reasonable accommodation to the known disabilities of applicants/employees. The University of Utah values candidates who have experience working in settings with students from diverse backgrounds, and possess a demonstrated commitment to improving access to higher education for historically underrepresented students.

134 GEORGIA GWINNETT COLLEGE invites applicants for faculty positions in Accounting to teach undergraduate courses in following areas: Auditing, Financial, and/or Taxation. The position is flexible to accommodate other teaching and research interests. Georgia Gwinnett College emphasizes teaching and student engagement. In addition, candidates must have a commitment to research that leads to quality refereed publications. Service to the university and the profession is also expected. Business experience is preferred. Applicants should send the following as a single packet: (1) completed GGC Faculty Application for Employment (found at: http://www.ggc.usg.edu/index.php/About-GGC-Careers-Opportunities.html), (2) letter of interest, (3) current *cv*, and (4) unofficial graduate and undergraduate transcripts, by scan and email to: apply@ggc.usg.edu; or mail to: Frances Troutman, Georgia Gwinnett College, 1000 University Center Lane, Lawrenceville, GA 30043. For more information: http://www.ggc.usg.edu/index.php/About-GGC-Careers-Opportunities.html?jobID=295.

135 OREGON STATE UNIVERSITY invites applicants for an Assistant Professor of accounting tenure-track position to begin September 15, 2009. The primary teaching area will be intermediate financial accounting at the undergraduate level. Candidates should hold the appropriate doctorate. Professional certification is desirable. Salary is competitive, fringe benefits are excellent. Oregon State University is located in Corvallis, rated the second best small city in America. Qualified candidates must submit an application electronically at: http://oregonstate.edu/jobs/Posting No. 0002730, including a letter of interest, current *vita*, recent teaching evaluations, evidence of scholarly work, and a list of three references. Review of applicants is ongoing and will continue until the position is filled. OSU is an Affirmative Action/Equal Opportunity Employer. Further information can be obtained by contacting Professor Roger Graham (roger.graham@bus.oregonstate.edu).

136 FORDHAM UNIVERSITY, School of Business invites applications for one position of Lecturer in Accounting starting in fall 2009. The position is for an initial appointment of two years, with the possibility of renewal. We are looking for an individual who has a demonstrated record of being an inspiring educator in auditing and accounting. A CPA is required and a doctoral degree is preferred. The teaching load is four courses per semester. The candidate is expected to teach basic and advanced courses in auditing and advanced accounting in our undergraduate and graduate programs. Applications should include a *curriculum vita* and three letters of reference. Applications and any inquiries or nominations should be sent to: Allen Schiff, Area Chair for Accounting and Taxation, Graduate School of Business Administration, Fordham University, 113 West 60th Street, New York, NY 10023. Fordham Business Schools are accredited by the AACSB. Fordham is an independent, Catholic university in the Jesuit tradition that welcomes applications from men and women of all backgrounds. Fordham University is an Affirmative Action/Equal Opportunity Employer.

137 UNIVERSITY AT BUFFALO, Department of Accounting is seeking candidates for a full-time, tenure/tenure-track faculty position, to begin fall 2009, to conduct research in accounting and teach accounting courses at the undergraduate, M.B.A., and Ph.D. levels. Appointments are expected to play a significant role in the development and delivery of education at the undergraduate and graduate levels. Senior appointments are expected to be actively involved with the business community and promotion of the school. Minimum Qualifications (Position): An interest in and a capacity to undertake scholarly research publishable in leading journals. An interest in and a capacity to effectively teach both undergraduate and graduate students. Candidates for senior positions must have a significant research track record and show evidence of an ability to mentor Ph.D. students. Doctorate with concentration in Accounting must be in hand at the time faculty duties commence. To apply for faculty posting #0800513, please submit a letter of interest, *curriculum vitae*, research papers, teaching evaluations (if feasible), other supporting information, and online application at: http//www.ubjobs.buffalo.edu/applicants/Central?quickFind=52356. The position will remain open until filled. Please send two letters of recommendation to: Professor William Kross, c/o Janet Kiefer, 375 Jacobs Management Center, Buffalo, NY 14260. The University at Buffalo is an Equal Opportunity/Affirmative Action Employer.

138 TEXAS A&M INTERNATIONAL UNIVERSITY Teach courses in financial and managerial accounting, produce scholarly research, and participate in service activities. Applicants must have earned an appropriate doctorate from a school accredited by the AACSB at the time of appointment. Doctoral degrees from schools not accredited by AACSB may be considered on a case by case basis. ABDs may be appointed for visiting positions at the instructor or Assistant Professor level. Candidates for the Associate or Full Professor level should show that they warrant appointment at that rank. The position is posted at http://www.tamiu.edu under "Jobs at TAMIU." Position will remain open until filled. Review of applications begins immediately. Application Procedure: Send electronically an application letter with supporting documentation including a current resume, transcripts of all graduate work (unofficial transcripts are initially acceptable), and at least three references to: ken.hung@tamiu.edu; DIBFS, 5201 University Boulevard, Laredo, Texas 78041. TAMIU is an Equal Opportunity Employer.

139 STATE UNIVERSITY OF NEW YORK AT OSWEGO invites applications for a tenure-track Assistant Professor of Accounting in the Department of Accounting, Finance, and Law. ABDs with completion of doctorate by the end of August 2009 will be considered. A Ph.D. in Accounting is preferred. Individuals with CPA license, teaching experience, publications, and other professional certifications are desirable. We seek individuals with demonstrated teaching ability in the field of accounting, and who can promote students' ability to succeed in multicultural and global communities. Review of applications will begin on January 5, 2009. For complete information about the position and application procedures, visit our website at: http://www.oswego.edu/vacancies. SUNY Oswego is an Affirmative Action Employer

140 KAPLAN UNIVERSITY, a thriving division of Kaplan, Inc., a subsidiary of The Washington Post Company, seeks dedicated educators for part-time academic-year, non-tenure-track appointments. Provide a learning environment in which students may attain success, including maintaining open/timely communication with students and the University via email; serving on committees; and referring students with questions regarding financial aid, academics, attendance and personal issues/concerns to appropriate departments. Actively participate in the University's retention efforts, including telephoning students not engaged in the course. Requirements: Master's of Accountancy (CPA) or M.B.A. with 18 hours in accounting; terminal degree preferred in accounting from an accredited institution; experience in area of teaching, minimum three years online teaching; ability to work independently with minimum supervision; ability to teach Auditing, Governmental and Nonprofit, Forensic, and International Accounting, along with general accounting courses. Please go to: http://www.kaplan.edu/careers. EOE.

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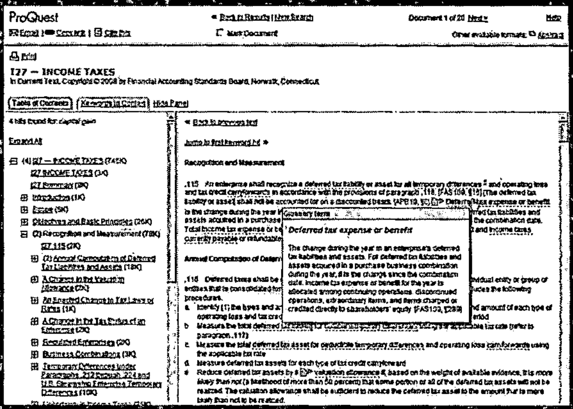

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Washington University in St. Louis

OLIN BUSINESS SCHOOL

POSITION ANNOUNCEMENT
ACCOUNTING

The Olin Business School at Washington University in St. Louis is seeking exceptional candidates to fill faculty positions beginning in Fall 2009 to teach courses in Accounting and/or related areas, conduct research, publish in peer-reviewed journals, advise students and participate in faculty meetings.

The Olin Business School has 73 full-time faculty and offers degree programs at the bachelors, masters, and Ph.D. level. Salary, teaching load and faculty support are highly competitive. More information about the school and current faculty can be found at http://www.olin.wustl.edu/.

Candidates for assistant professor should have their doctoral dissertation completed or near completion. Candidates for associate and full professor should have a substantial record of scholarship and an international reputation.

Applications are being accepted through the Washington University in St. Louis Faculty Recruitment link. Please visit our website: www.wustlcareers.com and click on the ***Search Posting/Apply*** tab on the left panel; then use the search criteria to review complete descriptions of positions and guidelines for applying. Application review will continue until all positions are filled.

Olin Business School and Washington University in St. Louis is an Affirmative Action/Equal Opportunity Employer and encourages women, minorities, dual career couples, and persons with disabilities to apply. Candidates from both within the USA and from outside the USA borders will be given full consideration.

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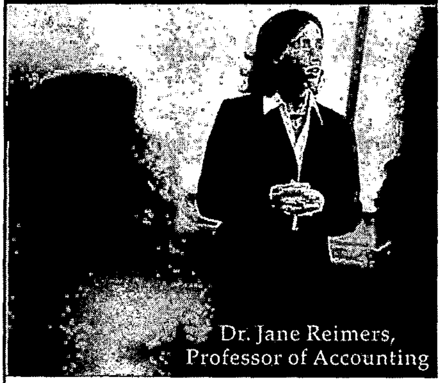

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